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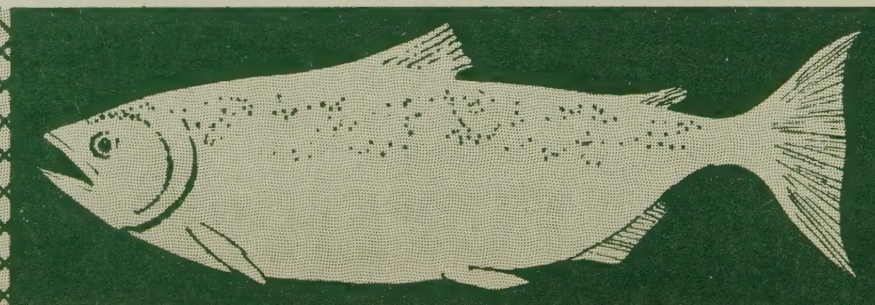

UNITED STATES DEPARTMENT OF THE INTERIOR
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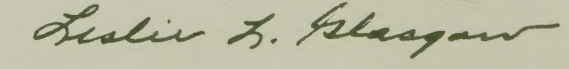
Philip M. Roedel, *Director*, BUREAU OF COMMERCIAL FISHERIES

FOREWORD

The Department of the Interior's Bureau of Commercial Fisheries publishes the monthly journal *Commercial Fisheries Abstracts* as one means of communicating to the fishing industry and allied groups the status of current fishery research. The research includes the biological aspects of fishery science as well as technological studies dealing with aquatic resource supply, harvesting, processing, utilization, and distribution.

Commercial Fisheries Abstracts contains summaries of selected articles from trade, engineering, and scientific journals dealing with the entire spectrum of fishery science. The publication is designed to serve the needs of fishery scientists, engineers, and managers in industry, academic institutions, and government by supplying timely information on current progress in fishery research and technology.



Leslie L. Glasgow
Assistant Secretary for Fish and
Wildlife, Parks, and Marine Resources

0.321 (7.51) STUDIES ON MUSCLE PROTEINS OF OCTOPUS

Katsumi, Seeko, and Koichi Kanna (Department of Chemistry, Sophia University, Chiyoda-ku, Tokyo, Japan; and Tokai Reg. Fish. Lab., Chuo-ku, Tokyo)
Bulletin of the Japanese Society of Scientific Fisheries 35, No. 11, 1094-1098 (November 1969) (In Japanese; figures, tables, and summary in English)

The muscle proteins of the mantle and arms of fresh octopus caught off Misaki, Kanagawa Prefecture, were compared with those of frozen ones caught off Africa. Aqueous extracts of the arms, but not of the mantle, showed a flow birefringence. Electrophoretic and ultracentrifugal patterns of the extracts of the arms were different from those of the mantle; salting-out analysis of the arm extracts indicated that the flow birefringence might be accounted for by the fastest peak in the ultracentrifugal pattern. (The senior author found a similar flow-birefringent protein in the aqueous extracts of squid arms in 1969.) Three small peaks in the ultracentrifugal patterns of the salt extracts (0.6 M KCl) were identified as actomyosin or similar proteins; since they were smaller in the extracts of the frozen muscle, denaturation during frozen storage was suggested. The muscle proteins were constituted as follows: from 20 to 21 percent albumin, from 68 to 70 percent actomyosin (globulins), and from 10 to 11 percent stroma.
[2 figures, 3 tables, 12 references]

 Abstracter: L. Baldwin

0.35 NONENZYMATIC REDUCTION AND OXIDATION OF MYOGLOBIN AND HEMOGLOBIN BY NICOTINAMIDE ADENINE DINUCLEOTIDES AND FLAVINS

Brown, W. Duane (Institute of Marine Resources and Department of Nutritional Services, University of California, Berkeley 94720), and H. E. Snyder (Department of Food Technology, Iowa State University, Ames 50010)
Journal of Biological Chemistry 244, No. 24, 6702-6706 (December 1969)

The authors report that the nonenzymatic reduction of metmyoglobin and methemyoglobin by NADH or NADPH (reduced forms of nicotinamide adenine dinucleotide and nicotinamide adenine dinucleotide phosphate) in the presence of ethylenediaminetetraacetate can occur at rates greater than most of those previously reported for enzymatic reduction.

The reduction rate is enhanced by the mediation of various flavins, including flavin adenine dinucleotide, flavin mononucleotide, and riboflavin. The system is more active at pH 6.4 than at pH 7.4. The presence of Amytal has no effect. Also, coenzyme Q_6 and menadione do not function as mediators of the reduction. The myoglobins from fish and from mammalian sources behave similarly, but tuna metmyoglobin requires a mediator for reduction.

The flavins, particularly flavin mononucleotide, under the influence of light irradiation can catalyze either the oxidation of oxymyoglobin or the reduction of metmyoglobin. However, this flavin-mediated reduction of metmyoglobin by NADH or NADPH takes place equally well in the dark.
[3 figures, 4 tables, 28 references]

 Abstracter: F. T. Piskur

0.4 (5.0)(4.91) LIPIDS OF ATHEROSCLEROTIC ARTERY--THE CAUSE OF ATHEROSCLEROSIS FROM THE VIEWPOINT OF FAT CHEMISTRY

Fukuzumi, K. (Department of Applied Chemistry, Faculty of Engineering, Nagoya University, Nagoya, Japan)
Fette-Seifen Anstrichmittel 71, No. 11, 953-957 (November 1969)

Early in 1969, the author presented a paper hypothesizing that cancer is generated by oxidizing lipids' accumulating in the body. Since practically no cell division occurs in the artery, cancer is not generated there. Instead, the author hypothesizes here, oxidized fats form complexes with blood-vessel proteins, and then such lipids as cholesterol and cholesterol esters are deposited around the complexes. Atherosclerosis is the result. Supplementing unsaturated fatty acids with vitamins B_6 and E helps prevent autoxidation of the fatty acids, and adding vitamin C (a strong reducing agent and a synergist of antioxidants) to the diet restricts the onset of atherosclerosis.
[1 figure, 4 tables, 45 references]

 Abstracter: L. Baldwin

0.5 DIFFERENTIATION OF CLOSTRIDIUM BOTULINUM TYPES A, B, AND E BY PYROLYSIS-GAS-LIQUID CHROMATOGRAPHY

Cone, R. D., and R. V. Lechowich (Department of Food Science, Michigan State University, East Lansing 48823)
Applied Microbiology 19, No. 1, 138-145 (January 1970)

Pyrolysis-gas-liquid-chromatography (PGLC) appears to be a promising method for the identification of bacteria. The purpose of the present study was to examine the uses of PGLC for the detection of growth and of toxin production of selected serotypes of pure cultures of C. botulinum in laboratory media.

Vegetative cells and spores of 10 strains of C. botulinum of types A, B, and E were grown in Trypticase-peptone-yeast extract (TPSY) medium. Five type E strains were grown in Multipeptone-sucrose-Nutramino acids (MSN) medium. Lyophilized samples were subjected to PGLC analysis, and the pyrograms were studied for variations in elution patterns between spores and vegetative cells of types A, B, and E grown in TPSY medium and spores and vegetative cells of type E grown in TPSY medium and spores and vegetative cells of type E grown in TPSY and MSN media. Growth and toxin production of all 10 strains of C. botulinum were examined by means of a modified dialysis sac culture technique. The dialysate supernatant fluid (DSF) obtained after centrifuging the 5-day-old cultures was also subjected to PGLC analysis. Control samples were also analyzed by PGLC and they consisted of (1) noninoculated DSF, (2) noninoculated DSF plus partially purified toxin, and (3) 1.0 mg. of partially purified toxin.
(over)

 Abstracter: F. T. Piskur

0.35 BIOLOGICAL AND BIOCHEMICAL APPLICATIONS OF ELECTRON SPIN RESONANCE

Ingram, D. J. E.
Published by Hilger, London (August 1969), x + 311 pp. Price 100s, UK.
K. A. McLauchlan (reviewer)
Nature 224, No. 5223, 989 (December 6, 1969)

This is an introductory textbook that uses the method of example rather than exhaustive review. Although electron spin resonance (ESR) methods were applied to biology as early as 1954, this book is timely because of the growing potential of the method. The book seems to be directed to the person experienced in ESR and wishes to apply the technique to biochemistry. [Abstracter: F. T. Piskur]

0.6 WATCH WHAT YOU EAT
(9.6)(2.05)

Hawthorn, J. (reviewer)
Food-Borne Infections and Intoxications
Hans Riemann (ed.)
Academic Press, New York and London, xxviii + 698 pp., (June 1969), 261s
Nature 224, No. 5223, 997-998 (December 6, 1969)

This book is Volume 5 in the series of monographs being published on Food Science and Technology. It contains contributions from 10 Americans, 3 Britishers, and 2 Japanese, all, the reviewer says, of repute. It also contains a glossary of the terms used, a genus and species index, and subject and author indexes. Various chapters deal with viral infections (drawing together widely scattered information on foods as vectors), halophilic vibrio infections (collating information largely acquired by Japanese investigators and hitherto not readily available to Western readers), infections caused by miscellaneous microorganisms, alimentary mycotoxicoses, food processing and preservation, poisonous plants and animals, parasitic infections, staphylococcal infections, and infections caused by perfringens and cereus. There is also a chapter on laboratory methods.

[Abstracter: L. Baldwin]

0.32 STUDIES ON NATURAL ACTOMYOSIN: SURVEY OF EXPERIMENTAL CONDITIONS

Herring, H. K., R. G. Cassens, T. Fukazawa, and E. J. Briskey (Department of Meat and Animal Science, University of Wisconsin, Madison 53706)
Journal of Food Science 34, No. 4, 308-311 (July-August 1969)

The purpose of this experiment was to establish the conditions under which the properties of bovine actomyosin could be studied; the objective was to relate such properties to tenderness of bovine muscle. Rabbit actomyosin was used as the standard of comparison because its properties are well known. The work involved a study of the effect of ionic strength, various cations, EDTA (ethylenediaminetetraacetate), pH, and buffer composition on the properties of bovine and rabbit actomyosin.

Natural actomyosin was prepared from the longissimus dorse of the bovine animal and the rabbit. The actomyosin from the rabbit had about two times the adenosine triphosphatase (ATPase) activity of that of bovine muscle. Both types of natural actomyosin reacted in a similar manner with respect to ionic conditions. They were activated by Mg^{++} at low KCl concentrations (20-50 mM), inhibited by Mg^{++} at high KCl concentration (100 mM), and activated by Ca^{++} at high KCl concentration (100 mM). Rabbit actomyosin was activated at low Mg^{++} (0.01 mM) concentration in the alkaline pH range, but bovine actomyosin was not. The rate of superprecipitation of bovine actomyosin was strongly inhibited by 40 mM tris-20 mM maleate; the rate of superprecipitation of rabbit actomyosin was inhibited to a lesser degree. The authors believe that the low ATPase activity and the nonactivation at low Mg^{++} in the alkaline range of the bovine actomyosin as compared to the behavior of rabbit actomyosin is a species difference.
[5 figures, 1 table, 32 references] [Abstracter: F. T. Piskur]

0.5

Differences between pyrograms of cultures were found to be suitable for positive identification at the type level but not at the strain level. Pyrograms were also obtained that permitted differentiation between spores and vegetative cells, and between the same cultures grown in different media. The dialysis sac technique could be used for detecting growth but not for detecting toxin production of C. botulinum. [4 figures, 3 tables, 9 references]

0.6 MEAT AND FISH FLAVORING
British Patent 1,163,949
W. R. Grace & Co. (pat.)
Food Technology 24, No. 2, 65 (February 1970)

Meat and fish products are seasoned with an aqueous mixture of fat, nonionic emulsifiers, and edible waxes. [Abstracter: F. T. Piskur]

0.34 THE ANALYSIS OF SMOKE AT IJMUIDEN
(3.4)
Ruiter, A.
Conserva 18, No. 3, 63-68 (1969) (In Dutch)
B.F.M.I.R.A. Abstracts 23, No. 1, Item 134, p. 36 (January 1970)

A very comprehensive survey of the constituents of smoke is given.

0.7 POISONOUS FOOD
(9.6)(6.37)

Jones, B. D. (reviewer)
Toxic Constituents of Plant Foodstuffs
Irvin E. Liener (ed.)
Academic Press, London and New York, xiii + 500 pp. (June 1969) 187s, $20
Nature 224, No. 5223, 998 (December 6, 1969)

This book is Volume 6 in the series of monographs being published on Food Science and Technology. It is a collection of 12 articles, each dealing with a particular series of toxic compounds (such as haemagglutinins, goitrogens, or allergens) or factors; each includes sections on the effects of particular toxins, their distribution, and methods of detection and detoxification. In view of the present situation with regard to the continued search for new and improved sources of protein, the reviewer says, this monograph is a useful reference for scientists interested in food problems generally and in nutrition, biochemistry, toxicology, and technology in particular.

The book has author and subject indexes and a good supply of references.

[Abstracter: L. Baldwin]

0.5 (9.19) DEGRADATION OF DDT AND DDE BY CHEESE MICROORGANISMS

Ledford, R. A., and J. H. Chen (Department of Food Science, Cornell University, Ithaca, New York 14850)
Journal of Food Science 34, No. 4, 386-388 (July-August 1969)

Because a tolerance now exists for DDT [1,1,1-trichloro-2,2-bis(p-chlorophenyl)ethane] and its analogs in milk and because cheese-making involves a concentrate of fat-soluble materials, residues of the pesticide may be present in cheeses. The purpose of this study was to determine the effect of the growth of representative types of microorganisms isolated from the surfaces of commercial samples of cheeses on the concentrations of lindane, DDT, and DDE in the growth media. Micrococci, streptococci, gram-positive rods, and yeasts were isolated from samples of Roquefort, blue, Limburger, Liederkranz, and brick cheeses. These organisms were plated in pesticide-containing media (0.5 p.p.m. of lindane, DDT, and DDE), and the plates were incubated at 32° C. for 10 days. The concentrations of residual pesticides were determined by electron capture gas chromatography.

The growth of micrococci and streptococci was not inhibited by the pesticides at the level used and, in addition, growth of these organisms did not produce any change in the level of the pesticides in the media. Gram-positive rods and the yeasts dechlorinated DDT during their growth in the media containing the pesticide. Aerobic growth of geotrichum species (yeasts) caused almost complete disappearance

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 Abstracter: F. T. Piskur

2.05 (2.118)(3.27) (2.3) BACTERIA COUNTS ON COD AND FLOUNDER FILLETS PRODUCED COMMERCIALLY FROM FISH FROZEN AT SEA AND THAWED IN WATER

Hayward, M. J., and W. A. MacCallum (Fisheries Research Board of Canada, Technological Unit, St. John's, Newfoundland)
Journal of the Fisheries Research Board of Canada 26, No. 12, 3217-3231 (December 1969)

In the future, greater quantities of market forms for cod (Gadus morhua) and and flounder (Hippoglossoides platessoides) may be prepared from fish frozen at sea and later thawed ashore. The purpose of this study was to determine, on a comparable basis, the sanitary quality of fillets prepared from fish frozen at sea and of fillets prepared from fish iced at sea.

Fillets of flounder and cod produced in two commercial plants from gutted fish that had been frozen in blocks at sea were practically free of fecal coliform organisms and generally contained fewer indicator bacteria (all organisms in the coliform group; fecal coliforms) than fillets produced in the same plants from fish iced at sea. Only relatively small numbers of coliforms were found on most fillets of thawed fish that were sampled on the conveyor leading from the skinner, on the skinned fillets after trimming and portioning, and on the fillets prepared from fish iced at sea and sampled immediately after skinning.

Frozen blocks of gutted or gutted-and-headed fish may be thawed by immersion in water at a temperature of 13°-20° C. and the water may be changed only infrequently--about every 12 hr., and the thawing periods may be of about 24-hr. duration. As many as five tankfuls of fish may be thawed during this period. Also,

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 Abstracter: F. T. Piskur

1.85 (1.013) BIOLOGÍA Y EVALUACIÓN DE LOS RECURSOS CAMARONEROS EN EL ÁREA DE LA CARPAS
[BIOLOGY AND EVALUATION OF SHRIMP RESOURCES IN THE CARPAS AREA]

Boschi, Enrique E. (Instituto de Biología Marina, Mar del Plata, Argentina)
CARPAS, Documentos Técnicos No. 13, 17 pp. (December 1969) (In Spanish; French and English summaries)

The shrimp and prawns that are being commercially exploited in Brazil, Uruguay, and Argentina belong mainly to eight species and subspecies of the Penaeidae family. They are distributed to the north beyond the limits of the Brazilian coast, into waters along the coasts of South America and the Southern United States. The northern areas of Brazil, especially those between Cabo Orange and the mouth of the Rio Para, are potentially rich in penaeids, the commercial catches there being estimated at between 10,000 and 15,000 metric tons a year. Another exploitation area is located in the central and southern regions; the commercial catches there range from 20,000 to 25,000 tons. The coastal lagoons of Uruguay are being partially exploited; the yield of these lagoons is estimated at between 10 and 50 metric tons. Three regions along the coast of Argentina are presently being exploited: the Mar del Plata region and vicinity, the rias of Bahia Blanca and southern Buenos Aires Province, and the coastal regions of Chubut Province. In 1967, these regions yielded 411.3 tons of shrimp and 204.3 tons of prawns for human consumption. [35 references, 1 map]

 Abstracter: L. Baldwin

2.1121 (2.1471) THE GERMAN ONE-BOAT MID-WATER TRAWL.
PART 6 - FISHING TACTICS AND LARGE CATCHES

Schärfe, J.
Fishing News International 8, No. 12, 36-38, 40, 43 (December 1969)

When the trials being reported here were first begun, the general opinion was that towing speed should be as high as possible so that fleeing fish could be overtaken and caught. However, it soon became evident that the speed required to chase fish could never be achieved--herring swim at about 6 knots, and the actual towing speed of German commercial trawlers towing midwater trawls will hardly ever exceed 4.5 knots. The best fishing tactics to give large catches, then, involve towing speeds that are slow enough to keep the frightening effect of the trawl gear at a minimum (net speeds of 1.8 knots can give very satisfactory catches), larger gear (6 $m.^2$ Süberkrüb otter boards and bridles of more than 100 m.), improved means of aiming the net and of continuously observing it and the position of the fish school, and the use of a double net (which divides the catch into two parts and permits the efficient handling of extra large catches without undue damage to the fish). The use of either suction or pressure pumps to remove fish from the cod end of overloaded trawl nets proved unsatisfactory; fish were damaged because maintaining the correct ratio of fish to water was impossible, and no satisfactory solution could be found to the difficulties encountered during operation of the hoses.

Because midwater trawling is appreciably more versatile than other fishing techniques, the author suggests that it will become more and more important. During

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 Abstracter: L. Baldwin

2.05 INCIDENCE OF CLOSTRIDIUM BOTULINUM TYPE E IN ALASKAN SALMON

Houghtby, Gary A., and Charles A. Kaysner (Food and Drug Administration, 5003 Federal Office Building, Seattle, Washington 98104)
Applied Microbiology 18, No. 5, 950-951 (November 1969)

The authors determined the incidence of Clostridium botulinum type E in salmon captured in the coastal waters and rivers of Alaska during the 1968 commercial fishing season. Four species of salmon were included in the tests: pink, sockeye, chinook, and chum. The results are summarized in the following table, including previously reported data on the Washington and Oregon areas.

Location	Incidence of C. botulinum type E in salmon			
	In the gills		In the viscera	
	Number of samples tested	Number of samples positive	Number of samples tested	Number of samples positive
Alaska	589	6	494	0
Washington	74	6	74	1
Oregon	70	4	70	0

[1 table, 8 references] [Abstracter: F. T. Piskur]

2.05

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the thawed fish may be held in chilled potable water or in crushed ice for 1 or 2 days prior to processing. [5 tables, 12 references]

2.05 MYCOTOXINS: METHODS FOR DETECTION IN FOODS

Ayres, J. C. (Food Science Division, University of Georgia, Athens 30601), H. S. Lillard (Southeastern Agricultural Research Laboratory, P.O. Box 5677, Athens 30604), and D. A. Lillard
Food Technology 24, No. 2, 55-58 (February 1970)

This paper is a review of the mycotoxins that occur in foods and the tests used to detect the presence of such toxins. [89 references]

[Abstracter: F. T. Piskur]

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of the DDT and DDE peaks from the gas chromatograms. The results suggest that residues of DDT and DDE might be degraded if the pesticides are present in certain types of surface-ripened cheeses.
[3 figures, 7 tables, 10 references]

0.5

2.1121 MODERN DEEP SEA TRAWLING GEAR
(9.6)

Garner, John
International Marine Publishing Co., Camden, Maine (n.d.). 79 pp. $7.50
National Fisherman 50, No. 11, S3 (March 1970)

This book gives fundamental principles and practical details of the design and operation of deep-sea trawls. It contains a chapter on the development of gear for stern trawlers and has large, exceptionally clear, fold-out drawings of both conventional and innovative trawls and related gear.

[Abstracter: L. Baldwin]

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development of the technique reported here, vigorous attempts were made to devise a combination midwater-bottom trawl suitable for practically all trawling operations. These attempts were not successful. Thus, for optimum catching efficiency a trawlerman needs three different types of trawl gear: a more or less conventional bottom trawl of sturdy construction and limited size for use in catching bottom fish on rough grounds; a larger, high-opening bottom trawl for use in catching bottom fish on reasonably even grounds; and a midwater trawl of the sort discussed in this six-part review. This later would be used for catching off-bottom and pelagic fish; it should be as large as the towing power of the vessel will allow for a net speed of about 2.5 knots. [8 figures, 15 references]

2.1121

2.3 SHELLFISH PROCESSING

U.S. Patent 3,471,894
Tasker, E. W.; Cape Ann Marine Research Co., Inc. (pat.)
Food Technology 24, No. 2, 65 (February 1970)

Shellfish, in a fluid medium, are shelled by a rapid lowering of pressure.

[Abstracter: F. T. Piskur]

The royal-red shrimp is an underused species. This paper reports on their distribution on grounds east of St. Augustine, Florida; south-southwest of the Dry Tortugas, Florida; and southeast of the Mississippi River Delta. On these grounds, the shrimp live only on soft bottom types and in water temperatures of 8° to 12° C.; the densities of shrimp vary seasonally on all three grounds; the depth distribution of shrimp also varies seasonally--the shrimp move offshore in summer and inshore in winter. [8 figures, 18 references] [Author's abstract]

Roe, Richard B. (Bureau of Commercial Fisheries, Exploratory Fishing and Gear Research Base, P.O. Box 1207, Pascagoula, Mississippi 39567)
Fishery Industrial Research 5, No. 4, 161-174 (October 1969)

1.85 DISTRIBUTION OF ROYAL-RED SHRIMP, HYMENOPENAEUS ROBUSTUS,
(1.0116)(1.0117) ON THREE POTENTIAL COMMERCIAL GROUNDS OFF THE SOUTHEASTERN UNITED STATES

2.1125 DEPTH-TIME SEQUENTIAL ANALYSES OF THE OPERATION OF TWO CALIFORNIA TUNA PURSE SEINES

Green, Roger E. (Bureau of Commercial Fisheries Fishery-Oceanography Center, P.O. Box 271, La Jolla, California 92037)
Fishery Industry Research 5, No. 5, 191-201 (December 1969)

Little information is available on the depth of a purse seine at different times during setting, though the timing of setting and pursing is important in the development of successful fishing tactics. The depth-time relation during setting was studied for two tuna purse seines of different size (7 strips deep, 470 fathoms long; 8 strips deep, 520 fathoms long) to which depth-time recorders were attached. From data gathered during 32 sets, composite sequence analyses and underwater net profiles were prepared for four basic stages (halfway through setting, end of setting, start of pursing, and halfway through pursing) of the setting and pursing operations.

Conclusions.--1. Very little fishing depth was obtained from either net during the time they were being paid out (from let go to end net).

2. The depth advantage from an extra strip of webbing in the net is not achieved until after the skiff is reached.

3. Maximum depth was reached by both nets during the first half of the pursing operation.

4. Extra depth may be obtained by postponing or slowing the pursing operation. [11 figures, 5 references]

 Reprinted in part

2.118 THE DEVELOPMENT OF SYSTEMS FOR EXPLOITING DISTANT-WATER FISHERIES

Bogucki, D. (Ship Design and Research Centre, Gdansk, Poland), and G. C. Eddie (White Fish Authority)
Transactions of the Institute of Marine Engineers 18, No. 10, 341-352 (October 1969)

The authors describe current types of and trends in ocean-going factory vessels, mother ships, and freezer trawlers. Recent development has been directed towards greater productivity and towards minimizing danger and discomfort. Mother ships and catcher vessels are already employed in some fisheries but for certain far-distant fisheries (for example, the Antarctic), the use of nuclear-powered depot-ships, which would remain on the grounds for as much as 4 years, is envisaged.

The design of distant-water fishing vessels, and the methods and equipment used on board, are influenced by market requirements, including consumer preference, for the fishery products. Operations analysis is being used to help identify the most effective and economically efficient fishing system for exploiting a particular fishery. The authors put forward the possibility of forming a mathematical model of a fishery as an instrument for guiding further development and management of operations. The number of options as regards choice of system is very large and because of technical developments the number of options is growing. The correct choice of system can be made only if based upon proper analysis of accurate technical and operational data, including market requirements. [10 figures, 30 references, 2 appendexes]

 Abstracter: F. T. Piskur

2.1128 TEST-TANK STUDIES OF SHRIMP-POT EFFICIENCY
(2.12)(1.85)

Kessler, Doyne W. (Bureau of Commercial Fisheries, Exploratory Fishing and Gear Research Base, P.O. Box 1668, Juneau, Alaska 99801)
Fishery Industrial Research 5, No. 4, 151-160 (October 1969)

During February, March, and April 1966, shrimp pots were studied under controlled conditions in a large test tank at Little Port Walter, Alaska. Primary goals were (I) to determine how shrimp escape from the pots and (II) to measure the relative efficiency of the pots in terms of the number of shrimp entering and escaping pots that had different types of entrances.

Tunnels of four different designs were incorporated in the ends of 12- by 12- by 24-inch wooden lath pots with 1- by 2-inch wooden frames. These tunnels were made of 3/8-inch nylon bobbinet. The fifth entrance was made from a 1-pound tin can set in the top of a 10-1/2- by 18- by 24-inch wooden lath pot.

Results of the experiment were analyzed statistically by analysis of variance and Duncan's new multiple-range test (Steel and Torrie, 1960). Because the variances were not homogeneous, it was necessary to perform a log transformation on the raw data before performing these tests.

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2.9 ALUTERIN: A TOXIN OF FILEFISH, ALUTERA SCRIPTA, PROBABLY ORIGINATING FROM A ZOANTHARIAN, PALYTHOA TUBERCULOSA

Hashimoto, Yoshiro, Nobuhiro Fusetani, and Shoji Kimura (Laboratory of Marine Biochemistry, Faculty of Agriculture, the University of Tokyo, Bunkyo-ku, Tokyo, Japan)
Bulletin of the Japanese Society of Scientific Fisheries 35, No. 11, 1086-1093 (November 1969)

During field surveys of ciguatoxic fishes in the Ryukyu Islands, the authors found that the viscera of filefish contains a water-soluble toxin (designated "aluterin" for convenience). Because the gut contents of one filefish was found to consist mainly of the zoantharian Palythoa tuberculosa, they also analyzed the toxicity of this coelenterate and found that it contains a toxin indistinguishable from aluterin. Using a hot-ethanol extraction procedure, they found that the toxicity of three sections (each containing about 10 polyps and weighing about 2 g.) of a colony of P. tuberculosa varied widely, being in a ratio of 200:10:1; the most toxic specimen had a value as high as 0.06 µg./g., which, if much more purified, would be equivalent to that of saxitoxin, tetrodotoxin, or ciguatoxin. Since the flesh, skin, and gills of the filefish were nontoxic, the authors believe they have substantiated the hypothesis that the toxin in marine fishes originates not in the fish but in the food chain.
[5 figures, 3 tables, 11 references]

 Abstracter: L. Baldwin

2.1128

The table below summarizes the results of the pot-efficiency experiments. Four tests were made with each pot entrance during the ease-of-entry experiment and four with each pot entrance during the ease-of-exit experiment; 80 shrimp were tested with each entrance during each experiment.

Kind of pot entrance	Shrimp in pot after 4 hr.			Shrimp outside pot after 4 hr.		
	Range	Mean	Std. Deviation	Range	Mean	Std. Deviation
	No.	No.	No.	No.	No.	No.
Long tunnel	3-7	5.25	2.06	0-1	0.25	0.50
Plastic pipe	2-7	3.75	2.22	1-3	2.00	0.82
Short tunnel	2-3	2.75	0.50	1-5	2.00	2.00
Top loader	0-4	1.25	1.89	2-5	3.50	1.73
Ramp	0-1	0.25	0.50	7-20	13.25	6.70

Shrimp were seen trying to escape the pots by means other than through the entrance tunnels. They tried to escape through the small cracks between the wooden slats and through small openings between the web and the side of the pot. Sometimes they attempted to escape by wedging the carapace through head first, but they usually inserted the tail through the crack first. The walking legs were then used to force the carapace through the narrow opening. Usually, this procedure was slow. The movement of the tail and walking legs resembled a burrowing type of behavior. Occasionally, the shrimp became violent, flipping their tail rapidly and straining their walking legs in an effort to force themselves through. In one test, several shrimp were seen escaping in this manner; therefore, the test was repeated after the pot had been repaired. [6 figures, 2 tables, 4 references]

2.9
(0.4)

EXTRACT OF IPOMOEA PES-CAPRAE (CONVOLVULACEAE) ANTAGONISTIC TO HISTAMINE AND JELLY-FISH POISON

Wasuwat, S. (Technological Research Institute, Applied Scientific Research Corporation of Thailand, Bangkhen, Bangkok)
Nature 225, No. 5234, 758 (February 21, 1970)

Noting that Thai fishermen use the creeper Ipomoea pes-caprae (L.) Roth. as an antidote to jellyfish stings and to prevent itching, the author examined the plant and found that it contains an active principle (hereafter referred to as IPA) that is antagonistic to jellyfish poison and, in addition, is mildly antihistaminic. In view of the fact that there is no known specific antidote for jellyfish poison (described in 1965 by Halstead as toxic proteins), the author compared the antihistaminic activity of IPA with that of two well-known antihistamines--Benadryl (diphenhydramine hydrochloride injection USP, BP) and Antistine (antazoline methanesulphonate injection BPC). Although the antihistaminic tendency of IPA is less efficacious than that of the two official antihistamines, its antagonistic effect against jellyfish poison is equivalent.
[1 table, 4 references] [Abstracter: L. Baldwin]

2.3 FISH SORTING APPARATUS

German Pending Application 1,454,209
Veb. Volkswerft Stralsund (pat.)
Food Technology 24, No. 1, 48 (January 1970)

The apparatus sorts fish according to their type and size. It uses sensors responsive to the length, breadth, thickness, and surface reflectivity of the fish. [Abstracter: F. T. Piskur]

2.143
(9.6)

FISHING WITH ELECTRICITY: ITS APPLICATION TO BIOLOGY AND MANAGEMENT

Vibert, R. (ed.)
International Marine Publishing Co., Camden, Maine (n.d.), 304 pp. $12.50.
National Fisherman 50, No. 11, S3 (March 1970)

This book is a collection of reports (given at an international meeting on electric fishing held in Belgrade, Yugoslavia, in 1966) written by electrical engineers, biologists, and technicians. It summarizes the status of electric fishing in fresh water and reviews the basic research that has been done in the field. [Abstracter: L. Baldwin]

2.1125

WORKING TIME OF DANISH SEINERS DURING ALASKA POLLACK FISHERY. III. RELATION OF WORKING TIME TO DEPTH OF FISHING GROUND

Maéda, Hiroshi, and Shiro Minami (Shimonoseki University of Fisheries, Shimonoseki, Japan)
Bulletin of the Japanese Society of Scientific Fisheries 35, No. 11, 1043-1048 (November 1969)

Alaska pollock exhibit a seasonal bathymetric migration pattern. To determine the influence of these seasonal differences on the catch, the authors examined the time spent for each of the steps in a seining operation at depths of 40, 80, and 150 m. The information, they suggest, should be useful in the construction of vessels more suitable to the Alaska pollock fishery. They found that the time to lay the seine increased negligibly (33 sec. per 100 m.) when warp length remained unchanged, that sinking-pulling time increased at a rate of 4 min. per 100 m., and that hauling-brailing time in the range of the tests was not affected by depth. Thus the time spent to complete a haul increased with depth at the same rate as the sinking-pulling time, or 3 percent of the total work time.
[5 figures, 8 references] [Abstracter: L. Baldwin]

2.3 FISH SORTING APPARATUS

German Pending Application 1,454,098
Nordischer Machinenbau Rud. Baader (pat.)
Food Technology 24, No. 1, 48 (January 1970)

The apparatus uses sensing devices responsive to the length of the fish to guide the fish into one of several routes. [Abstracter: F. T. Piskur]

2.3 FISH SORTING APPARATUS

German Pending Application 1,454,209
Veb. Volkswerft Stralsund (pat.)
Food Technology 24, No. 1, 48 (January 1970)

The apparatus sorts fish according to their type and size. It uses sensors responsive to the length, breadth, thickness, and surface reflectivity of the fish. [Abstracter: F. T. Piskur]

2.3 FILLET SLICING APPARATUS

German Pending Application 1,454,127
Rydbergs & Petterson A/S (pat.)
Food Technology 24, No. 1, 48 (January 1970)

Fish fillets are sliced by an apparatus that uses paralled knives mounted on a horizontal shaft. [Abstracter: F. T. Piskur]

3.11 (2.01) LACK OF SYNERGY OF EDTA WITH ANTIMICROBIALS IN RESISTANT ENTEROBACTERIACEAE

Neu, Harold C., and Elaine B. Winshell (Department of Medicine, College of Physicians and Surgeons, Columbia University, New York, N.Y. 10032)
Nature 225, No. 5234, 763 (February 21, 1970)

In 1965, Leive reported that ethylenediaminetetraacetic acid (EDTA) increases the permeability of Enterobacteriaceae to compounds such as actinomycin; in 1958, Repaske reported that it makes Escherichia coli susceptible to lysozyme lysis. Weiser et al. reported in 1968 that it increases the sensitivity of certain organisms that are resistant to penicillin, ampicillin, chloramphenicol, and tetracycline, apparently by overcoming their permeability barrier to these antimicrobials. The present authors undertook to establish whether it is synergistic with ampicillin, chloramphenicol, and tetracycline in bacteria whose resistance is either chromosomally or episomally determined.

Tests on organisms with and without EDTA showed that the maximum increase in sensitivity when the concentration was below the minimal inhibitory concentration (MIC) for EDTA was fourfold (MIC: the lowest concentration that would prevent turbidity). From this finding, the authors conclude that the effect of EDTA is not synergistic; rather, it is additive and attributable to variation in the method. Experiments on strains in which resistance was to less than 30 μg. and not episomally determined showed that the use of EDTA did not lower the MIC for ampicillin or tetracycline in E. coli, Aerobacter aerogenes, or Proteus mirabilis

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 Abstracter: L. Baldwin

3.15 (2.05) STUDY OF THE BASIC MICROBIOLOGICAL AND BIOCHEMICAL FACTORS INVOLVED IN THE IRRADIATION OF MARINE PRODUCTS

Liston, J., and J. R. Matches (College of Fisheries, University of Washington, Seattle)
Nuclear Science Abstracts 24, No. 2, 296-297 (January 31, 1970) (Available through the Clearinghouse for Federal Scientific and Technical Information, U.S. Department of Commerce, Springfield, Virginia 22151, 104 pp. Price $3.00)

Bacteria are responsible for the spoilage of seafoods. Irradiation of seafoods reduces the number of spoilage bacteria and thereby increases the storage life of these perishable products. The spoilage flora of irradiated fishery products is different from that of nonirradiated fishery products. This difference is due in part to irradiation and in part to packaging. Seafoods contain a mixed flora of gram-negative bacteria; at the time of spoilage of the seafood, the flora shifts to predominantly Pseudomonas bacteria. In irradiated seafoods, the mixed flora of gram-negative bacteria is virtually eliminated leaving predominantly the less radiation-sensitive Achromobacter and Lactobacilli. The biochemical patterns of the nonirradiated and irradiated seafoods are also different because of the different floras. The active oxidative organisms in the nonirradiated fish produce considerable volatile bases; the facultative and relatively inactive organism in the irradiated fish produce a comparatively small amount of volatile base.

From the standpoint of keeping quality of the seafood products, the size of the dose and the time of application (that is, the quality of the fish) are important. Irradiation of fish at low dose levels is effective when applied to very

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 [Extracter: F. T. Piskur]

3.15 UPTAKE OF OXYGEN IN REFRIGERATED RADIOPASTEURIZED FISH

Ronsivalli, L. J., and B. L. Tinker (Bureau of Commercial Fisheries, Technological Laboratory, Emerson Avenue, Gloucester, Massachusetts 01931)
Fishery Industrial Research 5, No. 4, 143-149 (October 1969)

In the preservation of most foods, the need to exclude oxygen from packages to prevent quality-degrading reactions from occurring during storage--for example, rancidity and changes in color--is well known. Researchers who have tested the feasibility of preserving seafoods by pasteurizing them with ionizing radiation have reported undesirable consequences of oxidative reactions in some samples packed with exposure to air.

Because of the ubiquity of spores of Clostridium botulinum and because of the suitability of most seafoods as a substrate for these organisms, whatever advantages are to be gained by excluding air from the package may be negated by the increased risk of botulism (should the product be mishandled and its temperature allowed to rise during storage). But the risk of botulism may not be restricted to anaerobically packed seafoods. Localized anaerobic sites can conceivably develop in containers even though air is not removed from the headspace before the container is sealed, especially when the package is not permeable to gases. Although the oxidation-reduction potential, not the oxygen tension, governs the growth of strict anaerobes, oxygen is nevertheless a factor in the establishment of the level of the oxidation-reduction potential.

Because of our growing interest in the role of oxygen in stored, radiopasteurized seafoods, the purpose of the study reported here was to determine the

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3.15 RADIATION PROCESSING OF FOOD PRODUCTS

Metlitskii, L. V. V. N. Rogachez, and V. G. Krushchev
English translation edited by M. Gerrard, F. F.McKinney, P. S. Baker, and E. Wierbicki. Available from the Clearinghouse for Federal Scientific and Technical Information, U.S. Department of Commerce, Springfield, Virginia 22151. (1968) 120 pp. $3.00.
Markakis, P. (reviewer)
Food Technology 24, No. 2, 76 (February 1970)

This book reports mainly on the research conducted at the A. N. Bakh Biochemistry Institute of the USSR Academy of Sciences and the All-Union Scientific Research Institute of the Food Canning and Vegetable Drying Industries of the Ministry of Food Industry of the U.S.S.R. Information concerning the work of other research centers in the U.S.S.R. and on the world literature is also included.

The book is divided into seven parts: (1) Introduction, (2) irradiation of potatoes and other vegetables to prevent sprouting, (3) radiation disinfestation of food products, (4) use of ionizing radiation to prevent microbial spoilage of food products, (5) wholesomeness and food value of irradiated food products, (6) sources and facilities for radiation processing of food products, and (7) the bibliography.

The bibliography contains 82 Russian references and 5 English general references.

 Abstracter: F. T. Piskur

3.15 PRESERVATION OF FISH BY IONIZING RADIATION: AN ANNOTATED BIBLIOGRAPHY

Weiss, F. J., F. E. McKinney, and L. M. Frye (Oak Ridge National Laboratory, Tennessee)
Nuclear Science Abstracts 23, No. 23, 4948 (December 15, 1969) (Available through the Clearinghouse for Federal Scientific and Technical Information, U.S. Department of Commerce, Springfield, Virginia 22151, 129 pp. Price $3.00, paper. Order No. ORNL-IIC-25)

This report is an annotated bibliography on the preservation of fish by ionizing radiation. It contains 331 citations and has author and subject indexes.
[Extracter: F. T. Piskur]

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changes in the percentage of oxygen in the headspace of hermetically sealed cans containing radiopasteurized fillets stored at about 0.5° C.
In cans that contained haddock fillets and that were (1) hermetically sealed at atmospheric pressure, (2) radiopasteurized, and (3) stored at about 0.5° C., the level of oxygen dropped from about 21 percent to about 2 percent within 30 days, at which time the percentage of oxygen was still falling. This decrease in the concentration of oxygen indicates that the atmospheric environment within the cans was conducive to the growth of aerobes, microaerophiles, facultative anaerobes, or anaerobes at various stages of oxygen depletion during the storage.
[4 figures, 7 references]

3.15

3.14 [PRESERVING EFFECTS OF SODIUM PYROSULPHITE]

Treshcheva, V. I.(VNIRO, U.S.S.R.)
Rybnoe Khozyaistvo 45, No. 4, 73 (1969)
Food Science and Technology Abstracts 1, No. 12, 612, Item 12R346 (December 1969)

The main effect of sodium pyrosulfite as a preservative for fish meal is its inactivation of putrefactive bacteria by the action of SO_2. Its inactivation capacity depends on the SO_2 content, which must not fall below 61.3 percent. Exposure to air releases SO_2 from pyrosulfite and changes it to inactive sulfite. Water inactivates pyrosulfite to acid sulfite, which breaks down as a result of heat during the drying process and releases SO_2. [Extracter: L. Baldwin]

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strains. An EDTA-treated culture of Salmonella typhimurium 131 containing an episomal resistance factor for tetracycline grew at a rate similar to that of the control. These results indicate that EDTA is not synergistic with ampicillin, chloramphenicol, or tetracycline in the test Enterobacteriaceae. The authors conceede that selected isolates of Enterobacteriaceae may contain permeability barriers and that in these organisms EDTA would be efficacious in altering resistance patterns; however, they have been unable to find such isolates.
[3 tables, 8 references]

3.11

2.40 [A NEW METHOD FOR COOLING AND COLD STORAGE OF SHRIMPS]
(3.2344)(3.2496)
(1.85)

Pel, L. van (Inst. voor Vissery Produksten, TNO, IJmuiden, The Netherlands)
Koeltechniek 62, No. 8, 161-163 (1969)
Food Science and Technology Abstracts 1, No. 12, 1608, Item 12R322 (December 1969)

Cooked shrimp are rapidly cooled in a vertical-plate cooler, boxed, and stored at 0° C. Using static air rather than forced air to maintain storeroom temperature saves labor and space and improves the quality and shelflife of the shrimp, since less weight is lost by evaporation. [Extracter: L. Baldwin]

On the basis of tests carried out over a 5-year period, researchers at Louisiana State University found that low dose gamma irradiation (^{60}Co) was effective in extending the iced-storage life of Gulf shrimp. Two shipping studies were carried out in cooperation with the U.S. Bureau of Commercial Fisheries. The results indicated that shrimp treated with 100 krad of irradiation kept 7 days longer in iced-storage than did the control of (nonirradiated) shrimp.
[Extracter: F. T. Piskur]

3.14 STUDIES ON THE NITROFURAN DERIVATIVE AS A FOOD PRESERVATIVE.
(2.01) XIV. THE EFFECT OF FURYLFURAMIDE ON BACTERIAL SPORES IN FISH SAUSAGE

Obatake, Atsushi (Faculty of Agriculture, Kochi Univ., Nankoku City, Japan), and Toshio Matsuda (Ueno Seiyaku Co., 85, Simoichiba, Itami City, Japan)
Bulletin of the Japanese Society of Scientific Fisheries 35, No. 11, 1131-1137 (November 1969)

Because the preservative effect of furylfuramide (2-(2-furyl)-3-(5-nitro-2-furyl)acrylamide) on fish sausage remains for a relatively long time, even at very low concentrations, the authors determined to investigate its effect on spores of Bacillus subtilis and of B. coagulans added to freshly ground kamaboko or to a heated casamino acid medium. Either 20 p.p.m. or 100 p.p.m. furylfuramide (FF) was added to the inoculated samples, and the samples were incubated at room temperature. FF had a bactericidal effect on both organisms when they were at the heat-sensitive stage--that is, on the vegetative cells of B. coagulans, but not on the spores; on the post-germination spores of B. subtilis, but not on the dormant spores. [4 figures, 11 references] [Abstracter: L. Baldwin]

The authors found that the organisms isolated from irradiated fish show greater average resistance to radiation than the organisms isolated from nonirradiated fish due to the elimination of the sensitive strains.

3.15

3.15 RADIATION PASTEURIZATION OF GULF SHELLFISH

Liuzzo, Joseph A. (Department of Food Science and Technology, Louisiana State University, Baton Rouge)
Annual Report, January 1, 1968-December 31, 1968, 25 pp.
Nuclear Science Abstracts 23, No. 22, 4706, Abstract No. 45981 (November 30, 1969)
(Available through the Clearinghouse for Federal Scientific and Technical Information, U.S. Department of Commerce, Springfield, Virginia 22151. Price $3.00, paper copy. Order No. ORO-669.)

3.15 (2.05) EFFECT OF IRRADIATION ON THE MICROBIAL FLORA SURVIVING IRRADIATION PASTEURIZATION OF SEAFOODS

Sinnhuber, R. O., and J. S. Lee (Department of Food Science and Technology, Oregon State University, Corvallis)
Nuclear Science Abstracts 23, No. 24, 5233 (December 31, 1969) (Available through the Clearinghouse for Federal Scientific and Technical Information, U.S. Department of Commerce, Springfield, Virginia 22151, 64 pp. Price $3.00)

The report is in three parts. The first part considers the sublethal effects of radiation on microorganisms, such as induced susceptibility to salt, chemical preservatives, and antibiotics. The results showed that, with microorganisms that would survive radiation pasteurization, the stated reagents would similarly affect the nonirradiated and irradiated cells.

The second part examines the spoilage characteristics of microorganisms in seafoods. The results showed that active microbial species can be found in nonirradiated and in irradiated (pasteurized) seafoods.

The third part of the report is a summary of the accomplishments on all work carried out on the particular irradiation of seafoods program.

 Extracter: F. T. Piskur

3.239 (1.55)(3.2349) INFLUENCE OF FREEZING RATE ON THE QUALITY OF LYOPHILIZED ALASKA POLLACK

Matsuda, Yumiko (Tokyo Univ. of Fisheries, Minato-ku, Tokyo, Japan)
Bulletin of the Japanese Society of Scientific Fisheries 35, No. 11, 1110-1115 (November 1969) (In Japanese; figures, table, and summary in English)

After being frozen under vacuum or in still-air at -30° C., samples of Alaska pollock were freeze dried (at a platen temperature of 35° C. and under a chamber pressure of from 0.3 to 0.04 mm. Hg) and stored at room temperature for up to 3 months. Evaluation of the frozen samples revealed that the tissue of samples frozen at a high rate under vacuum was good whereas that of samples frozen at a slower rate was spongy. The amount of soluble nitrogen decreased following freeze-drying, especially that in samples that had been frozen in still air. After 1 month's storage, however, the protein was almost completely denatured in both types of sample. Although both types of sample reabsorbed water easily immediately after they were dried, the water could be educed by slight pressure. The texture of the cooked product was not organoleptically equal to that of fresh pollock; however, cooked, freeze-dried samples--especially if they had been frozen under vacuum--were quite palatable throughout the 3 months' storage period.
[6 figures, 1 table, 13 references]

 Abstracter: L. Baldwin

3.15 (2.05) STUDIES ON MICROBIOLOGICAL SAFETY OF IRRADIATED FOODS. PART I. ON THE NATURAL LEVEL OF CONTAMINATION OF IRRADIATED AND NON-IRRADIATED FISH FLESH WITH CLOSTRIDIUM BOTULINUM TYPE E

Ando, Yoshiaki, and Kunio Kameyama (Hokkaido Inst. of Public Health, Sapporo, Japan)
Hokkaidoritsu Eisei Kenkyushoho, No. 19, 248-252 (June 1969) (In Japanese)
Nuclear Science Abstracts 23, No. 24, 5233 (December 31, 1969)

Samples of the homogenated meat of certain flat fish were placed in tubes and inoculated with 0, 1, 10^2, 10^3, and $>10^3$ spores of Clostridium botulinum type E and were irradiated at 0, 0.1, and 0.3 Mrad dose levels. A toxin assay of each sample was carried out after the tubes were stored at 10° C. for 2 weeks and at 20° C. for 3 days. Production of toxin was demonstrated in all the samples inoculated with more than 10^2 spores, but was not demonstrated in some of the samples inoculated with 10 spores and with 1 spore.

Two hundred fish (including flat fish, hatahata, Alaska pollack, and herring) were collected from the coastal districts in Hokkaido. Homogenates of samples from each of these fish were treated with gamma irradiation at dose levels of 0, 0.1, and 0.3 Mrad and subsequently stored at 10° C. for 2 weeks and at 20° C. for 3 days. On the average of from 2 to 4.5 percent of the samples were found to contain type E toxin, with the highest percentage (8.0) in the hatahata. Toxin was not detected in any of the samples irradiated at the 0.3-Mrad dose level.

 Extracter: F. T. Piskur

3.2491 (7.871) [QUALITY ASSESSMENT OF FROZEN FISH]

Agzhitova, L. A. (AtlantNIRO, U.S.S.R.)
Rybnoe Khozyaistvo 45, No. 4, 53-55 (1969)
Food Science and Technology Abstracts 1, No. 12, 1611, Item 12R341 (December 1969)

The subcutaneous yellow of the fat in mackerel, sardine, and sardinella is caused partly by carotenoid pigments and partly by oxidation as the fat becomes rancid. The first stage is the oxidation of carotene and the decoloring of the subcutaneous layer of fat. Later oxidation processes in the fat tissue cause yellowing. On the basis of spectrophotometric analysis in the ultraviolet and the visible ranges, the author found that absorption rises in the region of 320 mm. and falls in the visible spectrum (400-500 mm. maximum 422, 446, and 471 nm. [sic]), depending on the degree of oxidation. As the absorption in the visible spectrum increases, so does the carotene in the fat.

 Extracter: L. Baldwin

3.15 CONFERENCE ON FROZEN AND IRRADIATED FISH AND FISHERY PRODUCTS, MADRID, SPAIN, SEPTEMBER 8, 1967

Anonymous
Published by Fishing News (Books) Limited, 538 pp. (1969)
Nuclear Science Abstracts 24, No. 2, 297 (January 31, 1970)

The book contains 18 papers on the preservation of fish products by irradiation and about 60 additional papers on various aspects of frozen fish products.
[Extracter: F. T. Piskur]

3.2491 [EFFECT OF CAROTENOIDS ON THE SUBCUTANEOUS YELLOWING OF FROZEN SEA FISH]

Yakovleva, Z. A. (Azhcher NIRO, U.S.S.R.)
Rybnoe Khozyaistvo 45, No. 4, 56-59 (1969)
Food Science and Technology Abstracts 1, No. 12, 1612, Item 12R342 (December 1969)

Having observed that some fish develop subcutaneous yellowing several hours after being frozen and some do not, the author investigated by spectrophotometry 13 species of fish from the Black Sea and the Azov Sea and 30 species from the ocean. He divided them into four groups according to the fat and the carotenoid content in ethanol extracts of the skin. Yellowing was observed only in the one group that had both fat and carotenoids in the extracts. In groups having only one or neither of these components, yellowing was not seen.
[Extracter: L. Baldwin]

3.15 TOXIN PRODUCTION BY NATURALLY OCCURRING LEVELS (2.05) OF CLOSTRIDIUM BOTULINUM IN IRRADIATED AND NON-IRRADIATED SEAFOOD

Nickerson, J. T. R., and S. A. Goldblith (Massachusetts Institute of Technology, Cambridge, Mass.)
Nuclear Science Abstracts 23, No. 24, 5232 (December 31, 1969) (Available through the Clearinghouse for Federal Scientific and Technical Information, U.S. Department of Commerce, Springfield, Virginia 22151, 16 pp. Price $3.00).

Forty samples (120 individual portions) of commercially produced fish fillets (cod and haddock) were incubated and tested for botulinum toxin. One portion of each of the samples received no further treatment; one portion was irradiated with gamma rays at a dose level of at 100 krad.; and one portion was irradiated with gamma rays at a dose level of 200 krad. The portions were incubated for 6 days at 70° F. and then examined for botulinum toxin. The results indicated, on the basis of the conditions of the test, that low-dose irradiation treatment of cod and haddock fillets does not influence the outgrowth of Clostridium botulinum.
[Extracter: F. T. Piskur]

3.2349 INFLUENCE OF PLATEN TEMPERATURE OF FREEZE-DRYING (1.55)(3.239) ON THE QUALITY OF LYOPHILIZED ALASKA POLLACK

Matsuda, Yumiko (Tokyo Univ. of Fisheries, Minato-ku, Tokyo, Japan)
Bulletin of the Japanese Society of Scientific Fisheries 35, No. 11, 1116-1120 (November 1969) (In Japanese; figures and summary in English)

Samples of Alaska pollock were frozen under vacuum and then freeze-dried at platen temperatures of 55°, 35°, or 15° C. Following storage at room temperature for up to 3 months, the samples were analyzed. Platen temperature did not affect the texture or other organoleptic qualities or the water-reabsorptive or water-holding properties of the lyophilized pollock. It did affect the amount of soluble nitrogen. Immediately after drying, soluble nitrogen began to decrease abruptly and continued to do so throughout the storage period, but at a slower rate after the first month. Samples dried at platen temperatures of 15° and 35° were most noticeably affected; therefore the author concludes that a platen temperature of 55° C. gives a more favorable freeze-dried product.
[5 figures, 12 references] [Abstracter: L. Baldwin]

3.27 FISH DEFROSTING

British patent 1,163,578
AFOS Ltd. (pat.)
Food Technology 24, No. 2, 65 (February 1970)

Frozen fish are defrosted in moving trays by exposure to a flow of heated and humidified air. The direction of the air flow is reversed periodically.
[Abstracter: F. T. Piskur]

0.6 [TECHNICAL CHARACTERISTICS OF PLAICE MEAT]
(0.38)(1.69)

Ertel', L. Ya., and Z. S. Repina (TINRO, U.S.S.R.)
Rybnoe Khozyaistvo 45, No. 4, 71-72 (1969)
Food Science and Technology Abstracts 1, No. 12, 1611, Item 12R336 (December 1969)

Plaice meat matures very quickly, disintegrating and separating from bones and skin particularly after being heated. However, if the meat is coated with flour and baked, it does not disintegrate. The disintegrated meat is highly suitable for mincing and using as filling for meat pies. The cause of the quick maturing and disintegration is the considerable amount of proteolytic enzymes in the muscle tissue. Such high proteolytic activity has not been found in any other fish tissue. [Extracter: L. Baldwin]

3.2492 (3.231) (3.2385)(9.2) RELATION OF HUMIDITY TO ECONOMIC LOSS DURING STORAGE OF FISHERY PRODUCTS

Peters, John A. (U.S. Bureau of Commercial Fisheries, Technological Laboratory, Gloucester, Massachusetts)
ASHRAE Journal 12, No. 2, 73-76 (February 1970)

Research in the author's laboratory has shown that a large part of the quality defects in retailed frozen fish are attributable to dehydration. Three of the causes of dehydration are examined--the type of freezer, the type of packaging, and the temperature of the room--and possible remedies are discussed.

In the typical cold-storage room, the product is either slightly above or at the temperature of the air. The continued difference in the vapor pressure of the moisture in the product and that in contact with the cooler causes dehydration of the produce. Probably the most effective way of reducing this difference is to store the product in a jacketed freezer where all surfaces of the room serve as coolers. The next most effective storage room is one that has overhead pipe coils. The author gave several examples illustrating the economic impact of different types of freezer. For instance, at -5° F., the relative humidity of a jacketed storeroom is between 90 and 95 percent; of a storeroom with overhead plate evaporators, 75 percent; and of a commercial storeroom equipped with pipe coils, 85 percent. If 10,000,000 lb. of haddock fillet blocks are stored in the jacketed freezer and in the commercial freezer, the weight loss will be 830 lb./mo. and 6,700 lb./mo., respectively. If the blocks have a value of 28¢ a pound, the dollar

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 Abstracter: L. Baldwin

3.4 (2.3) GUIDELINES FOR THE PROCESSING OF HOT-SMOKED CHUB

Seagran, H. L., J. T. Graikoski, and J. A. Emerson (Bureau of Commercial Fisheries, Technological Laboratory, Ann Arbor, Michigan 48107)
U.S. Fish and Wildlife Service, Circular 331, iv + 23 pp. (January 1970)

The production of hot-smoked fish involves the careful handling and preparation of the raw product, brining of the raw fish to certain concentrations of salts, and then smoking the fish with concurrent heating to color, flavor, and cook the flesh. The finished product is then packaged and kept under refrigeration until consumed. All of these operations must be carried out in accordance with strict processing regimens and in a sanitary environment. Failure to observe such precautions may result not only in products of inferior quality reaching the consumer but, even more importantly, in products that could be hazardous to public health.

The purpose of this pamphlet is to provide descriptive guidelines for the preparation of hot-smoked chub that will be capable of meeting (1) the known requirements of the regulatory agencies concerned and (2) the economic requirements important to industry. These process recommendations are based on extensive research that considered the importance and interrelations of sanitation, raw material quality, product storage and handling, and particularly the process variables of heat and additives (sodium chloride and sodium nitrite) in attaining a safe, wholesome, and acceptable smoked chub product.
[8 figures, 2 tables, 6 references]

 Reprinted in part

3.339 POST-PROCESS SANITATION IN CANNERIES

Thorpe, R. H., and J. R. Everton
Technical Manual No. 1, 187 pp. (1968) (Fruit and Vegetable Preservation Research Association, Gloucestershire, England) £5.5
Charles A. Stevenson (reviewer)
Food Technology 24, No. 2, 74 (February 1970)

This manual deals with sanitation downstream from the sterilizing operation. It summarizes the findings from a research study carried out by the Research Assocation and the Research Department of the Metal Box Co. Ltd. in cooperation with 25 canner members of the Association. The study directed particular attention to continuous pressure sterilizers, particularly hydrostatic cookers. The primary object of the study was to gain an understanding of and to control leaker spoilage (contamination and spoilage of can contents resulting from leakage through the seams of the can after processing).

The book discusses (1) the practical aspects and limitations of in-plant chlorination, (2) the use of nondouble seam contact conveyors, and (3) sanitation problems unique to certain types of hydrostatic cookers. An appendix contains descriptions of certain bacteriological tests dealing with sanitation problems.

 Abstracter: F. T. Piskur

3.60 (3.2349) QUALITY EVALUATIONS OF FREEZE-DRIED COD STEAKS

Wood, A. L. (Fisheries Research Board of Canada, Halifax Laboratory, Halifax, Nova Scotia), and R. Legendre (Fisheries Research Board of Canada, Technological Station, Grande Rivière, Quebec)
Journal of the Fisheries Research Board of Canada 26, No. 12, 3271-3274 (December 1969)

Freeze-dried and frozen Atlantic cod were prepared at two locations and were examined to determine the effects of experimental processing conditions on the quality of the freeze-dried product. No significant difference in quality could be attributed to processing site, sex of fish, freezing rate, or thickness of samples. Freeze-dried steaks prepared from prerigor fish were superior in flavor, texture, and general quality to those steaks prepared from postrigor fish. Freeze-dried steaks were invariably tougher than the frozen steaks, but the appearance and flavor were not significantly different.
[2 tables, 4 references]

 Abstracter: F. T. Piskur

3.3343 ALASKA PINK SHRIMP, PANDALUS BOREALIS: EFFECTS OF HEAT TREATMENT ON COLOR AND MACHINE PEELABILITY

Collins, Jeff, and Carolyn Kelley (Bureau of Commercial Fisheries, Technological Laboratory, 622 Mission Street, Ketchikan, Alaska 99901)
Fishery Industrial Research 5, No. 5, 181-189 (December 1969)

For the improvement of the quality of canned pink shrimp, particularly its color, a process is needed so that fresh shrimp, rather than aged shrimp, can be peeled by machine.

In our work on this problem, the retention of color was improved during peeling if the shrimp were first given a heat pretreatment. During in-plant trials, 60- to 500-pound lots of shrimp were given various one-stage and two-stage heat treatments before they were machine peeled and routinely canned.

The precook method of preparing fresh shrimp for peeling by machine resulted in a canned product that had more color and had better texture and flavor than shrimp prepared for peeling by being held in ice or in refrigerated sea water. In some samples, gelling occurred in the liquor, and some cans had more sulfide blackening than usual. [7 tables, 6 references] [Authors' abstract]

3.4 SMOKING PROCESS

U.S. Patent 3,462,282
Fessman, G. (pat.)
Food Technology 23, No. 12, 71 (December 1969)

Finely divided wood chips or sawdust are exposed to superheated steam creating a "smoking fluid." The smoking fluid is brought in contact with the foodstuff, which is simultaneously cooked and smoke flavored. [Abstracter: F. T. Piskur]

3.3342 CLAM PROCESSING

U.S. Patent 3,471,300
Wendt, A. S.; HCA Food Corp. (pat.)
Food Technology 24, No. 2, 65 (February 1970)

Clam meats are exposed to steam prior to sterilization [canning?] to remove any undesirable odor or flavors. [Abstracter: F. T. Piskur]

3.4 SMOKING APPARATUS

German Patent 1,300,429
Raucherschmidt Tappen KG (pat.)
Food Technology 24, No. 1, 86 (January 1970)

The smoking chamber of the apparatus has heating elements under the parallel spaced bars of the smoke grill. [Abstracter: F. T. Piskur]

3.2492

loss will be $232 and $1,876 per month, respectively. Fish sticks lose a negligible amount of weight during 12 months' storage in the jacketed freezer; in the plate evaporator type freezer, they lose 0.13 percent a month. At 58¢/lb., the loss in the value of the fish sticks will be about $0 and $4,500 per month, respectively.

Packaging also influences the loss of moisture--the type of packaging material, the tightness of the closure, and the surface area of the package. In 1955, Foulon reported that the use of an aluminum foil-waxed paper package kept dehydration loss to a minimum in herring, regardless of the temperature of the storage room. However, even a completely vaporproof material will not prevent dehydration if voids are left between the product and the packaging material, for moisture vapor from the product will be deposited as frost, making not only for weight loss but for unsightly white areas. In 1951, Pottinger found that within-package dehydration of loosely packed mackerel and striped bass fillets was evident after only 1 month's storage, whether the temperature of the storage room fluctuated between -10° and 15° F. or was constant.

Much of the effect of low storage-room temperature on reducing weight loss derives from the reduced capacity of the air to hold moisture--1 lb. of air can hold 5.51 grains of moisture at 0° F., but only 1.84 grains at -20° F. Thus a reduction of 20 degrees in temperature is accompanied by a reduction of two-thirds in the drying power of the air. In 1952, Winter found that products subjected to fluctuating temperatures were of poorer quality at the end of storage than were products kept at constant temperature in identical packages. Yet the length of time the product was in storage, the wrapping material used, and the geometric configuration of the package had a considerably more pronounced effect on the quality of the product than the fluctuating temperature had.
[3 figures, 1 table, 12 references]

3.4 (3.12) USE OF SODIUM TRIPOLYPHOSPHATE TO CONTROL FISH SHRINKAGE DURING HOT-SMOKING

Barnett, Harold J., Richard W. Nelson, and John A. Dassow (Bureau of Commercial Fisheries, Technology Laboratory, 2725 Montlake Boulevard East, Seattle, Washington 98102)
Fishery Industrial Research 5, No. 3, 103-106 (August 1969)

Loss of moisture in the hot-smoking (kippering) of thawed halibut, salmon, and black cod results in an economic loss as well as in a loss of quality. Because sodium tripolyphosphate effectively reduces loss of moisture in other foods, including fresh fish, it was tried with these smoked products. Use of this substance effectively aided the retention of moisture in halibut and salmon during smoking but was less effective in aiding the retention of moisture in black cod. [3 tables, 5 references] [Authors' abstract]

3.4 SMOKEHOUSE CONTROL SYSTEM

British Patent 1,157,549
Alkar Engineering Corp. (pat.)
Food Technology 23, No. 12, 114 (December 1969)

The control system can be set to regulate the temperature, humidity, and operating time of the smokehouse. [Abstracter: F. T. Piskur]

4.13 (1.26) STUDIES ON THE LIPIDS OF HYPOMESUS OLIDUS PALLAS. I. ANALYSIS OF FATTY ACIDS IN THE TRIGLYCERIDES OF VISCERAL LIPIDS BY GAS-LIQUID CHROMATOGRAPHY

Ōta, Tōru, and Minoru Yamada (Faculty of Fisheries, Hokkaido University, Hakodate, Japan)
Bulletin of the Japanese Society of Scientific Fisheries 35, No. 11, 1138-1147 (November 1969) (In Japanese; figures, tables, and summary in English)

The triglycerides of the visceral lipids of pond smelt (Hypomesus olidus Pallas) were obtained by thin-layer chromatography (TLC); the yield was 89.4 percent of the total lipids used on fractionation. The fatty acids in the triglycerides were converted to methyl esters; the mercuric acetate derivatives of the methyl esters were separated by preparative TLC; and then each fraction was analyzed by gas-liquid chromatography. About 50 fatty acids having from 12 to 22 carbon atoms were found; most were normal fatty acids with from 14 to 20 carbon atoms. Linoleic acids (18:3, 20:3, 20:4, 22:3, 22:4, and 22:5) were among the polyunsaturated fatty acids. There were few branched-chain fatty acids (those having 14, 15, 16, or 18 carbon atoms) or polyunsaturated, odd-numbered fatty acids (21:4 and 21:5). [10 figures, 7 tables, 25 references]

 Abstracter: L. Baldwin

4.83 (2.113)(2.2) ON THE DESIGN AND TESTING OF AN ANTIFOULING PAINT INCORPORATING COPPERACETOARSENITE

Pillai, A. G. Gopalakrishna, K. Ravindran, and R. Balasubramanyan (Central Institute of Fisheries Technology, Craft and Gear Wing, Cochin, India)
Paintindia, 28-34 (October 1968)

Antifouling paints contain either copper or mercury or arsenic compounds. The antifouling life of a paint containing cuprous oxide, say, depends on its ability to maintain a steady leaching rate of 10 µg. of copper per square centimeter per day. The antifouling paint used on fishing boats should be effective for at least one full fishing season, about 8 or 9 months. Since most commercial antifouling paints now on the market do not meet this requirement, the authors investigated a number of formulations in which copperacetoarsenite was mixed with modified resin and Silix blends. The most effective composition (containing 35.63 percent copperacetoarsenite, 54.46 percent linseed oil resin, and 9.91 percent Silix by volume) was then tested for its leaching rate in sea water, in alkaline glycine, and in acid-alkali solutions; for its physical performance on cathodically protected steel structures; and for its biological effectiveness under raft exposure and actual service conditions.

Under tropical conditions in the Port of Cochin, the paint reached a critical leaching rate of 10 µg. Cu/sq. cm./day soon after immersion and maintained that rate steadily for about 9 months. It passed all the physical tests, including the one for erosion, satisfactorily. It kept panels of wood, steel, and aluminum
(over)

 Abstracter: L. Baldwin

4.90 COMPARATIVE EFFECT OF HERRING, MENHADEN, AND SAFFLOWER OILS ON BROILER TISSUES FATTY ACID COMPOSITION AND FLAVOR

Miller, David (National Center for Fish Protein Concentrate, Bureau of Commercial Fisheries, College Park, Maryland 20740), and Paul Robisch (Food Science Pioneer Research Laboratory, Bureau of Commercial Fisheries, Seattle, Washington 98102)
Poultry Science 48, No. 6, 2146-2157 (November 1969)

The purpose of this study was to determine the comparative effect of feeding oil of herring, menhaden, and safflower to broilers on the fatty acid composition and the flavor of the flesh of the birds. Three tasks were involved in the experiment: (1) determination of the fatty acid pattern of the tissues of the broilers fed two levels of herring oil (1.5 and 2.5 percent), (2) comparison of this pattern (task 1) with that pattern developed after feeding broilers oil of menhaden and safflower, and (3) evaluation of the effect of feeding the oils to broilers on the flavor of the meat.

The level of oil fed to the broilers influenced the quantitative deposition of the ω3, ω6, and ω9 fatty acids in the meat (the number following ω indicates the position of the first double bond, counting from the terminal methyl group). The fish oils, at the levels fed, affected the fatty acid patterns of the tissue lipids in relation to the ω3 and ω9 content of the oils. The menhaden oil was more effective than the herring oil in increasing the deposition of ω3 fatty acids; the herring oil was more effective than the menhaden oil in increasing the deposition of ω9 fatty acids.
(over)

 Abstracter: F. T. Piskur

6.193 RELATIVE CHEMICAL COMPOSITION AND NUTRITIVE VALUES OF KING CRAB, PARALITHODES CAMTSCHATICA, AND BLUE CRAB, CALLINECTES SAPIDUS

Kifer, Robert R., and Paul E. Bauersfeld (Bureau of Commercial Fisheries, Technological Laboratory, P.O. Box 128, College Park, Maryland 20740)
Fishery Industrial Research 5, No. 3, 121-131 (August 1969)

The Alaska king crabs are currently being harvested in sufficient volume so that quantities of processing waste are available for reduction into meal. Accordingly, the question has now arisen as to the potential and comparative nutritive value of king crab meal in broiler diets. The purpose of the work reported here therefore was to obtain information on the suitability of the use of king crab meal in the diets of broilers.

Under the conditions of the experiments reported here, king crab meal has a relatively high nutritive value and can be used effectively in broiler feeds. Rates of growth obtained from feeding the diets containing crab meal were equivalent to those obtained from a commercial formula, from a menhaden meal, or from a methionine-supplemented corn-soybean meal diet.

The utilization of feed in diets containing king crab meal was equally as efficient as was the utilization of feed in diets containing blue crab meal but was slightly less efficient than was the utilization of feed in the other diets tested.

Although the meals were not tested in breeding or laying diets, the crab meals could apparently be used in these feeds. Such use would take more advantage of their relatively high nutritive value and high mineral contents. [15 tables, 13 references]

 Reprinted in part

4.83

free of acorn barnacles, oysters, tubeworms, and hydroids for 7 months and permitted only mild growths of these organisms for the next 3 months; after 11 or 12 months, about 50 percent of the painted surfaces were fouled. Service tests on a departmental fishing vessel showed that paint containing copperacetoarsenite will keep hulls free of fouling much longer than commercial antifouling paints containing cuprous oxide will. [7 figures, 4 tables, 8 references]

6.192
(8.51)

EVIDENCE THAT TAURINE MAY BE ONE OF THE ELUSIVE UNIDENTIFIED FACTORS

Monson, W. J. (Borden Inc., Chemical Division, Nutritional Research Laboratory, Elgin, Illinois 60120)
Poultry Science 48, No. 6, 2069-2074 (November 1969)

The purpose of this study was to determine whether taurine is needed by chicks for maximum growth rate and, if so, whether this reaction is associated with the unknown factor activity of fish meal.

The authors found that addition of various levels of taurine to a corn-soy basal diet containing only about 0.0035 percent taurine did not usually improve chick growth unless a source of fermentation factor (the unidentified factor activity of the commercial fermentation product, Fermacto 500) was present. The taurine enhanced the effect of the fermentation factor, suggesting a synergistic action. The author suggests that taurine is one of the unidentified factors present in fish meal and other protein supplements and that its recognition was delayed because of the need of the second factor for taurine to express itself.

[6 tables, 7 references] [Abstracter: F. T. Piskur]

6.132 FISH MEAL

British Patent 1,164,314
De Sollano, Carlos S. F. D.; Carlos D. De Sallano Y Ortega) (pat.)
Food Technology 24, No. 2, 65 (February 1970)

Fish meal is manufactured aboard ship by drying the comminuted fish with heat supplied by the exhaust of the engine of the fishing boat.

[Abstracter: F. T. Piskur]

4.90

Of the five tissues examined (heart, thigh muscle, breast muscle, liver, and adipose fat), the dietary supplementation of fish oils affected the liver the most, in relation to the ω3 fatty acid content of the tissue. Safflower oil caused a substantial increase in ω6 fatty acids in all five tissues.

The ω9 fatty acid content was highest in the adipose fat and lowest in the liver and heart. Dietary additions of safflower oil decreased the ω9 fatty acid content of all tissues except the heart; herring fish oil increased the 18:1ω9 fatty acid content in all five tissues. (The first number indicates the chain-length of carbons in the fatty acid molecule; the second number indicates the number of double bonds.)

The continuous feeding of 1.5 and 2.5 percent levels of herring or menhaden oil to broilers tainted the meat. This off-flavor in the meat correlates directly with the increased deposition of 20:5ω3, 22:5ω3, and 22:6ω3 fatty acids in the tissues. [8 tables, 20 references]

4.13
(1.11)

STUDIES ON THE LIPID OF "RUVETTUS PRETIOSUS"
I. THE COMPOSITION OF ALCOHOLS AND FATTY ACIDS

Sato, Yoshikazu, and Yasuhiko Tsuchiya (Department of Fisheries, Faculty of Agriculture, Tohoku University, Sendai, Japan)
Tohoku Journal of Agriculture Research 20, No. 2, 89-95 (June 1969)

1. The fatty acid compositions of the various tissue oils of Ruvettus pretiosus were determined by gas liquid chromatography and were found to be mostly composed of oleic, palmitoleic and eicosaenoic acids in the flesh, skin and bone and oleic, docosahexaenoic and stearic acids in the heart and liver.
2. The ratio of saponifiable matter to the unsaponifiable matter ranged 40 to 45 percent in the flesh, 24 percent in the bone and 3.7 percent in the liver.
3. Hydroxy acid was absent from the lipids of all tissues of Ruvettus pretiosus.
4. The alcohol compositions of Ruvettus pretiosus were determined by gas liquid chromatography and were found to be mostly composed of cetyl, oleyl and palmitoleyl alcohols. [1 figure, 3 tables, 8 references] [Reprinted in part]

4.19 CHANGES IN THE LIPIDS DURING THE DEVELOPMENT OF SALMON EGGS

Takama, Kōzō, Kōichi Zama, and Hisanao Igarashi (Laboratory of Foods Chemistry, Faculty of Fisheries, Hokkaido University)
Bulletin of the Faculty of Fisheries Hokkaido University 20, No. 2, 118-126 (August 1969) (In Japanese; figures, tables, and summary in English)

To determine the changes in the lipids occurring in salmon eggs during the development stages, a series of samples was obtained from a single lot of eggs.

Results obtained were as follows. (1) The lipid content of the eggs was about 11-12 percent, which decreased markedly towards stage 5. (2) No marked changes were observed in the 3:1 ratio (except at stage 2) between acetone-soluble and conjugated lipids throughout the entire developing stages. (3) A marked decrease was seen in the lecithin and a remarkable increase in the cephalin fraction after stage 5. (4) Little selective consumption of the unsaturated fatty acid during the development stages was observed.

[5 figures, 6 tables, 8 references]

4.14 SPERM WHALE HEAD OIL. I. THE ESTER FRACTION

Challinor, C. J., Richard John Hamilton, and K. Simpson (Reg. Coll. Technol., Liverpool, England)
Chemical Abstracts 72, No. 4, 14070w (January 26, 1970)

6.195 VALUE OF MENHADEN, BREVOORTIA TYRANNUS, MEAL AS A PROTEIN SUPPLEMENT TO COTTONSEED MEAL-CORN DIETS FOR PIGS

Kifer, Robert R. (Bureau of Commercial Fisheries, Technological Laboratory, P.O. Box 128, College Park, Maryland 20740), and Edgar P. Young (Department of Animal Science, University of Maryland, College Park 20742)
Fishery Industrial Research 5, No. 4, 133-141 (October 1969)

The pig-feeding trials reported here had two aims: The first aim was to determine the supplementary value of 2 and 4 percent protein from menhaden meal in cottonseed meal-corn diets at total protein levels of 16, 15 and 14 percent. The second aim was to determine if menhaden meal added at these levels imparts an off flavor to the cooked meat of pigs.

The results indicated that supplementation with menhaden meal improved the rates of gain and utilization of feed when 2 percent protein from menhaden meal was added to cottonseed meal-corn basal diets. A further improvement was obtained when the menhaden meal protein level was increased from 2 to 4 percent.

No consistent trends in carcass data were observed that are related to the dietary treatment variables. In short, no relation could be found between the leanness of the meat and the quality of the protein.

No fishy flavor was detected in the loins of the pigs fed diets containing levels as high as 0.73 percent of fish oil contributed from the menhaden meal. [2 figures, 6 tables]

 Reprinted in part

6.199 (4.69) EFFECTS OF PERUVIAN ANCHOVY (ENGRAULIS RINGENS) MEAL SUPPLEMENTED WITH SANTOQUIN ON GROWTH AND FISHY FLAVOR OF BROILERS

Rojas, S. W., A. B. Lung, and R. V. Niño de Guzmán (Department of Nutrition, Universidad Nacional Agraria, La Molina, Lima, Peru)
Poultry Science 48, No. 6, 2045-2052 (November 1969)

In this study, the authors determined the response, in terms of growth, feed efficiency, pigmentation, and flavor, of broilers fed various levels of Peruvian anchovy meal. The soybean meal in the broiler rations (a corn-soy basal diet) was replaced with anchovy meal, and with anchovy meal containing Santoquin (ethoxyquin) at levels of 800 p.p.m. and 1,000 p.p.m. The anchovy meal was added to the diet at varying levels up to 20 percent.

No significant differences in growth rate or feed efficiency were found between the broilers fed any of the rations (one basic ration without anchovy fish meal, seven rations containing anchovy fish meal at varying levels of from 2 to 20 percent, seven rations containing the varying levels of anchovy fish meal supplemented with 800 p.p.m. of Santoquin, and seven rations containing the varying levels of anchovy fish meal supplemented with 1,000 p.p.m. of Santoquin). The shanks of broilers fed the Santoquin-treated fish meal were more pigmented than were those of broilers fed plain (untreated) fish meal. Fish meals (plain or supplemented with Santoquin) at levels of up to 8 percent in the ration produced no fishy or off-flavor in the meat of the broilers. Fishy and off-flavor was

(over)

 Abstracter: F. T. Piskur

6.197 ESTIMATING CALCIUM AND PHOSPHORUS IN FISH MEALS FROM THE ANALYSIS OF ASH

Ambrose, Mary E. (National Center for Fish Protein Concentrate, Bureau of Commercial Fisheries, College Park, Maryland), Willie L. Payne (Purdue Foods, Salisbury, Maryland), and Robert R. Kifer
Feedstuffs 42, No. 8, 28-30 (February 21, 1970)

In 1967, Kurtzman and Ambrose found that the values for phosphorus and ash in menhaden meals correlated well, as did those for calcium and ash. A knowledge of these values is critical because the dietary level of calcium and phosphorus and the ratio of the two in a feedstuff will markedly affect the rate of animal growth. However, direct chemical analysis of each lot of feedstuff before a feed formula is mixed is often impossible, and handbook values may be unavailable or unrepresentative. Therefore the authors undertook to devise methods of estimating calcium and phosphorus content from the ash content of various kinds of fish meal. Using the data from analyses of 72 samples of Peruvian anchovetta meal, 29 samples of Chilean anchovetta meal, 29 samples of Canadian herring meal, 35 samples of Norwegian herring meal, and 60 samples of menhaden meal, they examined the degree of correlation between the values for calcium and ash and between the values for phosphorus and ash. From a statistical interpretation of the correlations, they derived two methods of estimating calcium and phosphorus content as a function of ash content.

In one of the methods, the ash values for each of the fish meals are plotted against the calcium values and against the phosphorus values for each of the meals. The appropriate mineral value can be read directly from one of the graphs once the ash value for a given meat has been obtained by analysis.

 ABSTRACTER: L. Baldwin

6.32 (0.32) PROLINE IN THE VESICLES AND SPORELINGS OF VALONIA VENTRICOSA AND THE CONCEPT OF CELL WALL PROTEIN

Steward, F. C., R. L. Mott, H. W. Israel, and P. M. Ludford (Laboratory of Cell Physiology, Growth and Development, Cornell University, Ithaca, New York 14850)
Nature 225, No. 5234, 760-763 (February 21, 1970)

This report is taken from findings made during more extensive investigations on the metabolism of proline and hydroxyproline in plants. Mature, freshly collected, Valonia ventricosa vesicles--and the aplanospores to which they may give rise--were used in the experiment. Three fractions from each vesicle were analyzed and their combined amino-acid contents measured: the outermost layer of wall, contaminated with various organisms such as bacteria, protozoa, and other algae; a relatively clean, thick, predominantly cellulosic cell wall that had been washed free of cytoplasm and the gross contamination of the outer layers; and the whole living content of the vesicle. The relation between proteins in cytoplasm and in walls was examined.

The analyses showed that the combined proline in the cell wall is in the outermost contaminated layer. Less than a 5-percent residual contamination of the inner by the outer layer would have accounted for the proline content of the inner layer, regardless of the presence of the minute hapteron cells (at the base of the vesicle) that enclose some protoplasm. The small amount of proline in the clean algal wall was not accompanied by any appreciable amounts of hydroxyproline. An upper limit of <2 percent of dry weight was placed on the protein content in the wall of mature Valonia. Practically all the combined proline of the intact clean vesicle was in the protoplasm. The radioactivity absorbed during the growth of

 Abstracter: L. Baldwin

6.197

In the other method, the mean value and the standard deviation for calcium as a percent of ash and for phosphorus as a percent of ash were determined for each of the meals. Then a factor (mean value minus one-half a standard deviation, divided by 100) for each type of meal was used to calculate calcium or phosphorus from an ash value determined by analysis. By this method, calcium or phosphorus value (in percent) can be found by multiplying the ash value (in percent) by the appropriate factor. The factors for meal are shown in the table below.

Fish meal		Calcium content of the ash		Calcium factor1/	Phosphorus content of the ash		Phosphorus factor1/
Type	Country of origin	Mean	Standard deviation		Mean	Standard deviation	
		Percent	Percent		Percent	Percent	
Anchovetta	Peru	25.84	1.98	0.248	16.97	1.10	0.164
	Chile	23.38	2.90	0.219	16.56	1.23	0.159
Herring	Canada	19.14	3.16	0.175	14.38	1.51	0.136
	Norway	18.53	2.79	0.171	14.34	2.49	0.131
Menhaden	United States	28.68	2.26	0.276	17.73	2.05	0.167

1/ Factor = (Mean minus one-half standard deviation)/100
Calcium value of meal in percent = (ash content of meal in percent) (Calcium factor)
Phosphorus value of meal in percent = (ash content of meal in percent) (Phosphorus factor).

The authors state that even if an analysis for ash cannot be made and the mineral values not calculated, the values they have given for calcium and phosphorus are based on enough samples to be used as handbook values.
[2 figures, 3 tables, 15 references]

6.31
(9.6)

SEAWEEDS OF CAPE COD AND THE ISLANDS

Kingsburg, John M.
Chatham Press, Old Greenwich, Connecticut (1969) (illus.) $12.50
Jack B. Pearce (rev.)
Underwater Naturalist 6, No. 2, 45 (Summer-Fall 1969)

Despite the implication of the title, this book covers most of the species occurring in Long Island Sound and along the mid-Atlantic coast. In the introduction, the author distinguishes algae from flowering plants; discusses the effects of waves, currents, and tides on the distribution of algae; and states the problems involved in collecting and preserving algae. Following, he gives a succinct resumé of the derivation of the scientific name, of the identifying characteristics, and of the ecological aspects of each of the species considered. For instance, he discusses the relation between the green sea lettuce, Ulva lactuca, and pollution in offshore and estuarine waters and the introduction to American shores of the weedlike green alga Codium and its subsequent adverse effects here.

The reviewer suggests that this book, in conjunction with E. Yale Dawson's Marine Botany (1966), would be a useful part of the library of marine scientists working with East Coast marine plants.

6.32

STEROLS OF CHLORELLA -- III. SPECIES CONTAINING ERGOSTEROL

(6.37)

Patterson, Glenn W. (Department of Botany, University of Maryland, College Park)
Comparative Biochemistry and Physiology 31, No. 3, 391-394 (November 1969)

Assuming that the nutritive value of Chlorella, like that of any potential food source, should be examined, the author analyzed five species of Chlorella containing primarily Δ 5,7 sterols. He found that sterols constituted about 0.2 percent of the dry weight of the cells; that ergosterol was the major sterol; and that 22-dihydroergosterol, Δ^7 ergosterol, and 5-dihydroergosterol were also present, but in smaller amounts. The sterols of all five species--C. simplex (Artari) Migula, C. nocturna Shihira and Krauss, C. sorokiniana Shihira and Krauss, C. vannielii Shihira and Krauss, and C. candida Shihira and Krauss--were qualitatively and quantitatively similar.

[Abstracter: T. Baldwin]
[2 tables, 10 references]

6.32

sporelings in the presence of ^{14}C-proline (10 μCi/ml.) was not significantly present in the cell wall; any radioactivity there did not exceed the expected radioactive background, or cross scatter, or the possibility of casual contamination during cutting. Nearly all the radioactivity from ^{14}C-proline was present in the protoplasm, being heavily concentrated in the nuclei.

The findings clearly indicate that the concept of a major cell wall protein is inapplicable to Valonia vesicles. They also point to the inadequacies of algal analyses that are based on examination of hydrolysates of fractions of homogenized preparations. In addition, they show that the analysis of plant materials for combined hydroxyproline as the measure of cell-wall protein is meaningless. In this light, the authors say, the work they have done on the protein content of mature Valonia vesicles and on the incorporation of ^{14}C-proline into the vesicles growing from aplanospores is particularly significant.
[8 figures, 1 table, 24 references]

6.133

OIL RECOVERY

German Pending Application 1,492,857
A/S Atlas Maschinenfabrik (pat.)
Food Technology 24, No. 2, 72 (February 1970)

Raw materials such as fish and whalemeat are heated under conditions that coagulate the protein and facilitate the separation of the solids from the liquid phase.

[Abstracter: F. T. Piskur]

6.197

[Abstract: L. Baldwin]

6.199

found in the meat of the broilers fed 10, 15, and 20 percent anchovy fish meal. The fishy and off-flavor was more pronounced in the meat of the female chicks than in the meat of male chicks.

The authors conclude that a level of 10 percent anchovy fish meal may be used in broiler rations without imparting undesirable flavor to the meat of the broilers.
[6 tables, 23 references]

6.210
(1.118)

A FISH MEAL INDUSTRY IN TENNESSEE

Anonymous
U.S. Government Research and Development Reports 70, No. 2, 24 (January 25, 1970)
Available through the Clearinghouse for Federal Scientific and Technical Information, U.S. Department of Commerce, Springfield, Virginia 22151, 9 pp.
Price $3.00, paper copy. Order No. PB-187980.

The purpose of the study was to determine the feasibility of using low-value species of fish from Tennessee reservoirs for the production of fish meal. Two factors were considered: (1) the effectiveness of certain fishing gear and (2) the suitability of fish stocks and their harvesting in the manufacturing of fish meal. Two features were considered: (1) the effectiveness of certain fishing gear in harvesting the fish stocks and (2) the suitability of carp, fresh-water drum, and shad for processing into fish meal.

[Abstracter: J. T. Piskur]

6.54 FISH FLOUR EXPERIMENTS IN CAPE TOWN INSTITUTE

Anonymous
Fishing News International 8, No. 12, 48, 51 (December 1969)

In the 1968 report of the Fishing Industry Research Institute, Cape Town, South Africa, G. M. Dreosti and Alison Atkinson describe two experiments in the production of fish protein concentrate (FPC).

In the first experiment, hake and anchovy FPC's were prepared from protein materials that had been batch extracted five times with aldehyde-free alcohol and then desolventized in a dehydrator at 150° F. Comparative analysis of the two showed, for anchovy FPC and hake FPC, respectively: average yield, 12.43 and 14.80 percent; protein content, 81.2 and 86.2 percent; salt content, 1.1 and 0.14 percent; and organoleptic rating (on a 10-point scale), 7.0 and 8.5 for FPC from whole fish and 8.0 and 9.5 for FPC from headed and gutted fish. The organoleptic rating of both types of FPC remained unchanged after 2 months' storage at room temperature. The greyish brown of the anchovy FPC made it more noticeable in maize-meal porridge than the hake FPC.

In the second experiment, FPC made from fresh hake waste (backbones, fins, and flesh but no heads or offal) without solvent extraction was tested as a protein-supplement replacement for FPC made by solvent extraction from pilchard or from anchovy. Presscake samples were prepared either from the whole material or from flesh that had been separated from the bone with boiling water. Before being dried, the samples were (1) washed three times in water (1 presscake:4 water), 5 min. per wash, the first wash in 180° F. water, the last two in cold water; (2)

(over)

 Abstracter: L. Baldwin

6.54 NUTRITIVE VALUE OF 1,2-DICHLOROETHANE-EXTRACTED FISH PROTEIN CONCENTRATE

Ershoff, Benjamin H., and Perry G. Rucker (Institute for Nutritional Studies, Culver City, California 90230)
Journal of Food Science 34, No. 4, 355-359 (July-August 1969)

The results of the experiments described in this report indicate that a fish protein concentrate (FPC) that is nontoxic and of high nutritional value (when fed as the sole source of protein to immature rats) can be prepared by extracting ground codfish fillets with 1,2-dichloroethane (DCE).

The purpose of the study was to determine the effect of extraction time and temperature, and of other processing variables, on the nutritive value of FPC prepared by extracting ground cod fillets with DCE. The FPC preparations were analyzed for protein and residual solvent content. Nutritive value of the FPC samples was determined by rat feeding tests using diets containing 10 percent casein protein, 20 percent protein from casein or FPC, and 20 percent protein as combinations of casein and FPC with each ingredient providing one-half the protein.

The nutritive value of the FPC preparations was dependent upon the temperature and length of time of the extraction with DCE. In the feeding tests with rats (at the 20 percent protein level), the FPC extracted with DCE at 65°±2° C. or 40°±2° C. for 24 hr., or at a temperature of 83° C. for 6 hr. or 3 hr. and vacuum dried, gave weight gains and feed efficiency comparable to those of diets containing casein protein. FPC prepared by extracting the ground cod fillets with DCE for 24 hr. at 83° C. then dried under 29 in. of vacuum at 100° C. for 18 hr. was

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 Abstracter: F. T. Piskur

6.54 (0.4) EFFECTS ON MAN OF DAILY INGESTION OF SMALL DOSES OF ISOPROPYL ALCOHOL

Wills, J. H., E. M. Jameson, and F. Coulston (Institute of Experimental Pathology and Toxicology, Albany Medical College of Union University, Albany, New York; New York State Department of Health, Albany; and Medical Department, Clinton Prison, Dannemora, New York)
Toxicology and Applied Pharmacology 15, No. 3, 560-565 (November 1969)

Isopropyl alcohol is used as a dewatering and defatting agent in the preparation of some fish protein concentrates (FPC) and to remove chlorocholine chloride from the FPC prepared by extracting fish with 1,2-dichloroethane. The problem that arises concerns the safety of continued ingestion of a small residue of isopropyl alcohol that may remain in FPC. The purpose of the present study was to determine the effects of daily ingestion by human volunteers of amounts of isopropyl alcohol that might be retained in FPC used to supplement protein-poor diets. These experiments with human subjects were undertaken only after extensive studies with rats and monkeys, wherein these species took 20 mg./kg. day of isopropyl alcohol by stomach tube without obvious effect.

Groups of eight men drank either a placebo (an inert preparation given for its psychological effect to satisfy the user and to act as a control in an experimental series), 2.6 mg./kg. of isopropyl alcohol or 6.4 mg./kg. of isopropyl alcohol daily for 6 weeks. The researchers found no significant changes in the chemical or cellular compositions of the blood and urine, in the ability of the liver to excrete sulfobromophthalein, in the optical properties of the eye, or in the general well-being of the volunteer subjects. [3 tables, 14 references]

 Abstracter: F. T. Piskur

7.461 RAPID AND CONVENIENT SALT MEASUREMENT IN MEAT, FISH, AND CHEESE

Vander Werf, Loren J., and Alfred H. Free (Ames Co., Division Miles Laboratories, Inc., Elkhart, Indiana 46514)
Journal of the Official Analytical Chemists 53, No. 1, 47-48 (January 1970)

The authors recommend that a collaborative study be made on the use of the QUANTAB method for the analysis of salt in meat, fish, and cheese. They found that the QUANTAB Chloride Titrator is a convenient tool for monitoring salt content in meat, fish, and cheese, providing meaningful information useful for easier quality control during processing. Typical results obtained for various types of meat, fish, and cheese are given. Samples of fish included canned tuna, red salmon, sardines, and mackerel; and ocean perch and codfish sticks. The results obtained by the QUANTAB Chloride Titrator method compared favorably with those obtained by the official AOAC Volhard method.
[1 table, 5 references]

 Abstracter: F. T. Piskur

6.54
highly toxic to immature rats, and the toxicity was associated with a high residual content of DCE. This same FPC preparation, subjected to vacuum steaming for 45 min. at 10 in. of vacuum, was not toxic to rats (7-day feeding test) but did lose some of its nutritive value. FPC, prepared by the same general procedures, except that the solvent lost during the extraction process was replaced at 2- to 3-hr. intervals during the 24-hr. extraction period, was nontoxic to rats (7-day feeding period) and differed only slightly from casein in nutritive value.
[4 tables, 5 references]

6.54

washed as before and acidified (from pH 7.9 to 4.5) with concentrated HCl; or (3) processed as in (2) and then treated with BHT (butylated hydroxytoluene, 0.002 percent of weight of presscake). All presscakes were then dried in air at 150° F. till their moisture content was less than 10.0 percent, and the resulting products were stored at room temperature in air-permeable bags or at 32° F. in 4-oz. cans sealed under nitrogen. Flavor tests showed that the FPC untreated with acid or antioxidant received the highest ratings; acidified samples, especially those treated with BHT, developed a bitter flavor during storage and were rated slightly lower than the solvent-extracted anchovy FPC; FPC's from whole material and from flesh alone received similar ratings before and after storage.

In a second test, presscakes were processed as before, but the first wash for one sample was at 212° F. instead of 180° F., and the BHT treatment of half that sample was at 0.2 percent rather than 0.002 percent. The flavor rating for the FPC made from presscake washed at 212° F. was 9.0; BHT treatment increased the rating to 9.5. The rating for the FPC's made from presscake washed at 180° F. was 8.75. Storage at room temperature for 6 months did not change these ratings.

Since all the water-washed samples received very good ratings, the authors conclude that hake FPC can be used as a protein supplement in place of solvent-extracted pilchard or anchovy FPC. Although the loss of soluble protein during water washing is about 20 percent higher than during cooking and pressing only, water-washed FPC is a blander product than unwashed FPC. Moreover, it is almost as good nutritionally as solvent-extracted FPC and it is not quite as expensive to make.

7.45
(6.54)

ADAPTATION OF THE AOAC FLUORINE METHOD FOR DETERMINING FLUORIDE IN FISH PROTEIN CONCENTRATE

Klemm, R. Bruce, and Mary E. Ambrose (National Center for Fish Protein Concentrate, Bureau of Commercial Fisheries, College Park, Maryland 20740)
Journal of the Official Analytical Chemists 53, No. 1, 3-6 (January 1970)

The AOAC Official method (24.029-24.035) for the determination of fluorine in foods was modified for use on fish protein concentrate (FPC). Using this modified method, recoveries of fluoride added to FPC before ashing (the samples are ashed in preparation for analysis) averaged 96.0±3.0 percent.
[1 figure, 3 tables, 3 references] [Abstracter: F. T. Piskur]

6.39
(9.6)

BIOLOGY OF YEASTS. THE YEASTS, VOL. 1

Rose, A. H., and J. S. Harrison (eds.)
Academic Press, London, England, 508 pp. 140s (n.d.)
Murdoch Mitchison (reviewer)
New Scientist 45, No. 683, 72 (January 8, 1970)

This book is the first volume of a projected set of three. The next two will cover yeast technology and the physiology and biochemistry of yeast. All contain review articles by many authors. The reviewer states that this first volume is an authoritative book, well produced and illustrated, the standard advanced reference on yeast for some years to come, essential for libraries.
[Abstracter: L. Baldwin]

6.32
(6.37)

CALORIFIC VALUES OF BENTHIC MARINE ALGAE AND THEIR POSTULATED RELATION TO INVERTEBRATE FOOD PREFERENCE

Paine, R. T. (Department of Zoology, University of Washington, Seattle, 98105), and R. L. Vadas (Departments of Botany and Zoology, University of Maine, Orono)
Marine Biology 4, No. 2, 79-86 (October 1969)

Calorific values (kcal./g. dry weight, percent ash, and kcal./ash-free gram of dry weight) were investigated for Nitzschia paradoxa (a marine diatom), Phyllospadix scouleri (a marine tracheophyte), and 70 species of benthic algae (with emphasis on Ulva, Hedophyllum, Fucus, Prionitis, Gigartina, and Iridaea). The values within genera were relatively homogeneous, being dependent on phyletic affinity, water purity, immersion depth, growth form, generation time, and susceptibility to herbivorous predation; season, growth rate, and plant part had little effect. Invertebrate herbivores seemed to prefer the large perennial brown algae or the broad-thallus red algae, both of which tend to be relatively low calorically. Thus the authors conclude that invertebrates' food preference is governed by availability rather than food value.
[1 figure, 2 tables, 35 references] [Abstracter: L. Baldwin]

7.520

RADIOACTIVE MARKERS IN ANALYSIS OF AMINO ACID CHROMATOGRAMS

Exss, Reinhard E., Hoyle D. Hill, and George K. Summer (Department of Biochemistry, School of Medicine, University of North Carolina, Chapel Hill)
Separation Service 4, No. 4, 295-300 (August 1969)

A persistent problem in the use of automatic ion exchange chromatography (Sparkman, Stein, and Moore, 1958) is the identification of unknown peaks on a chromatogram. The present authors showed that radioactively labeled amino acids can be used as markers in the analysis of amino-acid chromatograms. In fractions of column effluents, the C^{14}-labeled amino acids can be detected retatively easily and economically by liquid scintillation or gas-flow systems. The interference of the small quantity of labeled amino acid required to give a significant counting rate with the color yield of the amino acids under study was negligible.
[2 tables, 7 references] [Abstracter: F. T. Piskur]

7.51 EFFECT OF VARYING THE EXTRACTION PROCEDURE ON THE PROTEIN EXTRACTABILITY OF FROZEN-STORED FISH MUSCLE

Ravesi, Elinor M., and Margaret L. Anderson (Bureau of Commercial Fisheries, Technological Laboratory, Emerson Avenue, Gloucester, Massachusetts 01931)
Fishery Industrial Research 5, No. 4, 175-180 (October 1969)

The amount of extractable protein in frozen-stored fish muscle is often used as a criterion of its textural quality. An assessment of the texture of fish muscle by an organoleptic test panel, however, often shows poor correlation with the amount of protein that is extracted from the muscle.

Because we hypothesized that the amount of protein that can be extracted from frozen fish muscle depends, in large part, upon the technique of extraction used, we studied the effects of varying the solubility-test procedure, using one lot of frozen-stored cod muscle. Depending on the length of time that the sample was blended and the concentration of the neutral-salt extractant used, the amount of extractable protein varied between (1) values considered to represent minimum extractability in frozen cod muscle that has undergone extensive textural deterioration and (2) values considered to be typical of recently frozen cod.

These contradictory results indicate a need for standardizing the extraction procedure. We believe that such standardization will minimize the lack of correlation now found in the literature between the content of soluble protein and the extent that the texture of frozen fish muscle has deteriorated as evaluated organoleptically. [2 tables, 14 references]

 Authors' abstract

7.86 (0.5) INHIBITION OF ESCHERICHIA COLI DURING THE INVERTED TUBE TEST FOR SALMONELLA

Banwart, George J. (Market Quality Research Division, Agricultural Research Service, U.S. Department of Agriculture, Beltsville, Maryland 20705)
Poultry Science 48, No. 6, 2022-2025 (November 1969)

Banwart et al. (1968) described a test for rapid detection of Salmonella-negative samples of pasteurized dried whole egg based on the fermentation of mannitol by the Salmonella that might be present in the food. But, organisms other than Salmonella ferment mannitol; therefore, the reliability of the test could be improved if mannitol fermentation of organisms other than Salmonella could be inhibited and if the method could be applied to a wider variety of food products. The present study, then, was undertaken to determine the effect of brilliant green dye on the motility of and the mannitol fermentation by Escherichia coli and two species of Salmonella (S. oranienburg and S. typhimurium).

Addition of 12.5, 25, or 50 mg./l. of brilliant green dye to semisolid mannitol purple agar in inverted tubes did not significantly inhibit the fermentation of mannitol by S. oranienburg or S. typhimurium, but 100 mg./l. of brilliant green dye did significantly inhibit fermentation. Addition of 12.5 mg./l. of brilliant green dye to the semisolid mannitol purple medium significantly inhibited the fermentation of mannitol by E. coli. The author recommends that 12.5 mg./l. of brilliant green dye be added to the semisolid mannitol purple medium when used in the inverted tube test for detection of Salmonella.
[3 tables, 3 references]

 Abstracter: F. T. Piskur

7.599 (4.11) GAS CHROMATOGRAPHIC DETERMINATION OF N-ALKYL NITROSAMINES

Foreman, J. K., J. F. Palframan, and E. A. Walker (Laboratory of the Government Chemist, Stamford Street, London S.E.1, England)
Nature 225, No. 5232, 554 (February 7, 1970)

Since many N-nitrosamines are carcinogenic at very low concentrations, a specific, sensitive, quantitative method for determining their presence is needed. Polarographic methods are sensitive to < 1 p.p.m., but they are not specific; thin-layer chromatographic methods give a degree of discrimination between these compounds, but they, too, are not completely satisfactory. Described here is a specific, sensitive, gas chromatographic method for detecting simple N-alkylnitrosamines that are volatile in steam.

Using the separation procedure of Heath and Jarvis (1955), the authors were able to recover 95 percent of the dimethylnitrosamine and 97 percent of the diethylnitrosamine added to corned beef at the 1 p.p.m. level. The method is directly applicable to aqueous samples. With microporous polymer beads as a column packing, water is rapidly eluted in a narrow band that does not interfere with the detection of N-alkylnitrosamines. Using standard solutions, the authors were able to achieve a lower detection limit of 1 p.p.m., which corresponds to 10^{-2} µg. in a 10 µl. injection on the column. However, they point out, the practical detection limit depends on the degree of purification attained during sample extraction. Use of a favorable concentration technique--for example, repeated distillation

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 Abstracter: L. Baldwin

7.73 (7.89) DRAINED WEIGHT DETERMINATION OF FROZEN ALASKA KING CRABMEAT

Miller, George A. (Food and Drug Administration, 909 First Avenue, Seattle, Washington 98104), and J. Richard Pace (Wakefield Fisheries, Seldovia, Alaska 99663)
Journal of the Official Analytical Chemists 53, No. 1, 9-11 (January 1970)

The authors recommend that the official first action Werren-Weik method for drained weight determination in shrimp be amended to include frozen glazed Alaska king crab meat and that the Alaska King Crab Board method be adopted as an alternative official first action method for frozen glazed Alaska king crab meat.

In the present paper, the authors report on the collaborative evaluation of the two methods for determining the drained weight of Alaska king crab meat. One variable--the effect of added flood water and surface glazing--was examined with both methods. The collaborative test showed that results are comparable for dry-packed unglazed crabmeat units, freshly packed crab meat containing added flood water, and freshly cut units containing a surface glaze.
[1 table, 2 references]

 Abstracter: F. T. Piskur

7.85 (7.86) ASPECTS OF FOOD QUALITY: USEFULNESS AND LIMITATIONS OF MICROBIAL INDICES FOR QUALITY ASSURANCE

De Figueiredo, Mario P. (Sara Lee, Inc., Deerfield, Illinois 60015)
Food Technology 24, No. 2, 51-53, 55 (February 1970)

The author discusses why and how microbial indices are used for food quality evaluation. He considers the indices of total viable counts, direct microscopic counts, coliforms, fecal streptococci, and staphylococci.
[23 references] [Abstracter: F. T. Piskur]

7.84 (7.871)(4.11) USE OF ELECTRON PARAMAGNETISM IN RESEARCH ON FISH LIPIDS

Rouhal, William T. (Bureau of Commercial Fisheries Food Science Pioneer Research Laboratory, 2725 Montlake Boulevard East, Seattle, Washington 98102)
Fishery Industrial Research 5, No. 3, 107-115 (August 1969)

The products of lipid oxidation cause undesirable alterations, not only in lipids themselves, but also in the quality of associated proteins, enzymes, and other biomolecules. Fundamental studies of oxidizing lipids in biochemical systems are needed if these undesirable changes are to be minimized.

Measuring the paramagnetic properties of these systems has great potential for elucidating the mechanism of the undesirable changes and thereby giving us a possible way of finding how to control them. Unfortunately, this technique of measurement is not widely understood.

This paper explains the technique and gives examples of how the measurement of paramagnetic properties can be applied in research related to fish lipids, particularly in the relation of free-radicals to the loss of nutritive value and in the study of antioxidant functions. [3 figures, 6 references] [Author's abstract]

7.80 (6.1) MANUAL DE MÉTODOS DE ANÁLISIS DE HARINA DE PESCADO
(ANTEPROYECTO DE NORMAS PARA LOS PAÍSES DE LA CARPAS)
I - MÉTODOS QUÍMICOS
[MANUAL OF METHODS FOR THE ANALYSIS OF FISH MEAL (STANDARDS FOR CARPAS COUNTRIES). I - CHEMICAL METHODS]

Moreno, V. J., and J. E. Aizpún (Instituto de Biología Marina, Mar del Plata) CARPAS, Documentos Ocasionales, No. 12, 25 + 3 pp. (November 1969) (In Spanish)

This document describes the techniques currently used in the authors' laboratories for making chemical determinations on fish meal. It includes methods used in other laboratories and countries, comparing similarities and commenting on the extent of their use in practice. The methods discussed have been chosen for convenience, whether for simplicity, precision, or rapidity; nearly all are used internationally.

The main subjects covered are: General methods - determination of moisture, nitrogen and crude protein, urea and volatile nitrogenous bases, total lipids, iodine number, ash, total phosphorus, calcium, residue insoluble in HCl (sand), and sodium chloride; methods for the control of protein quality - pepsin digestibility, determination of assimilable lysine, and determination of the absorption of orange G. [3 photographs, 28 references] [Abstracter: L. Baldwin]

7.42 POTASSIUM ION SPECIFIC ELECTRODE WITH HIGH SELECTIVITY FOR POTASSIUM OVER SODIUM

Frant, M. S., and J. W. Ross, Jr. (Orion Research Incorporated, Cambridge, Massachusetts 02139)
Science 167, No. 3920, 987-988 (February 13, 1970)

Measurements of the activity of the potassium ion (K^+) are basic to an extremely wide range of problems that include membrane transport and conduction processes and the potassium budget of the ocean. The authors describe a new electrode made with commercially available materials (valinomycin and a variety of aromatic solvents) that responds to K^+ concentrations of from 1 mole per liter to 10^{-6} mole per liter. The electrode is highly selective for K^+ over Na^+ (10,000:1) and over divalent ions. It can be used for the direct determination of K^+ in human serum.
[2 figures, 1 table, 7 references] [Abstracter: F. T. Piskur]

7.42 (9.19) X-RAY FLUORESCENCE DETERMINATION OF IRON IN POLLUTED STREAMS

Tackett, Stanford L., and Margaret A. Brocious (Department of Chemistry, Indiana University of Pennsylvania, Indiana, Pa. 15701)
Analytical Letters 2, No. 12, 649-655 (December 1969)

Water discharged into streams from mining and industrial operations is frequently polluted with iron. The method of analysis proposed for the determination of iron in polluted streams involves the addition of chromium as an internal standard and requires no other chemical pretreatment. The samples are spotted directly onto chromatographic paper disks and analyzed by X-ray fluorescence spectrometry. The method is rapid and is best for the quantitative determination of Fe in waters where the Fe content is in the range of from 5 to 400 p.p.m.
[1 table, 6 references] [Abstracter: F. T. Piskur]

7.47 (6.135) ANALYSIS OF ODOROUS GASES GENERATED FROM FISH-SOLUBLES AND FISH MEALS

Kuroda, Daisuke (Osaka-Shiritsu Kogyo Shikensho, Osaka, Japan)
Chemical Abstracts 72, No. 6, 24273d (February 9, 1970)

7.52 METHODS FOR DETERMINING AMINO ACID AVAILABILITY OF FEEDS

Bragg, D. B., C. A. Ivy, and E. L. Stephenson (Department of Animal Sciences, University of Arkansas, Fayetteville 72701)
Poultry Science 48, No. 6, 2135-2137 (November 1969)

Two methods for determining amino-acid availability of feedstuffs were studied; the first used the surgically modified (artificial anus) 4-week-old chick, and the second used 4-week-old normal chicks. The values for amino-acid availability obtained in the test using normal chicks were slightly lower than the values obtained in the test using surgically modified chicks. Because the individual chicks of the surgically modified groups sometimes exhibited values greater than 100 percent, the authors believe that the method using the normal chicks is more accurate. [3 tables, 5 references] [Abstracter: F. T. Piskur]

7.599 or evaporation of an appropriate solvent--should give detectable nitrosamine in amounts approaching 0.01 p.p.m.

The authors say that their gas chromatographic method can also be used for analysis of complex nitrosamines; however, some other separation procedure would have to be used for nonvolatile nitrosamines--possibly solvent extraction.
[1 figure, 9 references]

7.89 FRAGMENTATION OF FISH MYOFIBRIL.
EFFECT OF STORAGE CONDITION AND MUSCLE CATHEPSIN

Tokiwa, Tomonobu, and Hiroyuki Matsumiya (Nomura Research Institute of Technology and Economics, 1600 Kajiwara, Kamakura, Kanagawa, Japan)
Bulletin of the Japanese Society of Scientific Fisheries 35, No. 11, 1099-1109 (November 1969)

In 1967, Love found that the myofibrils of frozen cod muscle varied according to the temperature at which the muscle was frozen. Those from muscle frozen in liquid air were joined together along their sides; those from muscle frozen at -3° C. and stored at -1.6° C. for a week were mostly very short fragments. From these findings, Love suggested that microscopic examination of the homogenate of muscle would give much information about the fragility of the cells and the toughness of the meat. Using 33 species of fish, the present authors investigated the velocity and extent of myofibrillar fragmentation and the effect of storage condition and muscle proteinase on the fragmentation.

The extent and velocity of myofibrillar fragmentation varied widely with species--for example, more than 55 percent of the fibrils of jack mackerel (Pneumatophorus japonicus) were small fragments composed of from 1 to 4 sarcomeres, whereas more than 70 percent of the fibrils of Japanese red bream (Pagrosomus major) were long, composed of more than 10 sarcomeres, and, even after 7 days' storage, very resistant to the stresses of additional homogenization. Cathepsin hydrolyzed myofibrillar proteins at 35° C. and an acidic pH but had little effect at 0° C. and pH 4.5. The myofibrils of muscle stored at -15° or -28° C. fragmented

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 Abstracter: L. Baldwin

8.0 (8.51)(8.42) CHEMICAL COMPOSITION OF SHRIMP FLESH (PARAPENAEUS SPP.) AND ITS NUTRITIVE VALUE

Dabrowski, Teofil, Edward Kolakowski, and Barbara Karnicka (Sea Fisheries Institute, Gdynia, Department of Commercial Fish Technology, Szczecin, Poland)
Journal of the Fisheries Research Board of Canada 26, No. 11, 2969-2974 (November 1969)

This paper reports the yield of edible meat from whole shrimp caught off Georges Bank, and the chemical composition of the meat of these shrimp. The shrimp ranged in length from 15.5 to 23.4 cm. and in weight from 17.1 to 65.0 g. The mean weight was 37.3 g. The average yield of edible meat from the whole shrimp was 51.3 percent with a range of from 47.2 to 55.1. The proximate composition of the meat on the average was: water, 76.74 percent; fat, 0.91; ash, 1.71; and total protein, 22.07. The total phosphorus content of the meat was 0.490 percent. Data are given on the free amino-acid composition of the meat and on the amino-acid composition of the protein of the meat.

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 Abstracter: F. T. Piskur

7.89 RAPID ESTIMATION OF FRESHNESS OF FISH
BY NUCLEOSIDE PHOSPHORYLASE AND XANTHINE OXIDASE

Ehira, Shigeo, and Hitoshi Uchiyama (Tokai Reg. Fish. Res. Lab., Chuo-ku, Tokyo, Japan)
Bulletin of the Japanese Society of Scientific Fisheries 35, No. 11, 1080-1085 (November 1969) (In Japanese; figures, tables, and summary in English)

The method used by Jones et al. (1964) for rapidly estimating the freshness of fish muscle was modified so that it could be applied to the muscles of fish that accumulate inosine rather than hypoxanthine after death. A perchloric-acid extract of the muscle tissue is neutralized with potassium hydroxide, the precipitated perchlorate is removed, and the extract is buffered with phosphate buffer (at pH 7.6) and mixed with an aqueous solution containing nucleoside phosphorylase and xanthine oxidase. After the mixture has been incubated at 37° C. for 30 min., the uric acid produced is determined by measuring the absorption at 293 mμ. Then another aliquot of the extract is treated in the same way except that xanthine oxidase only is used as the enzyme solution. The uric acid derived from hypoxanthine in the tissue is determined, and this amount is subtracted from the total amount to give the amount originating from inosine in the tissue. The amounts of inosine and hypoxanthine recovered from the extracts were rather good, from 92 to 106 percent and from 95 to 106 percent, respectively. These values agree well with those obtained by ion-exchange chromatography.

Pacific salmon is known to be an inosine-accumulating species. During the experiment reported here, the authors found that jack mackerel is, too.
[2 figures, 3 tables, 20 references]

 Abstracter: L. Baldwin

8.59 (7.591) LACTATE DEHYDROGENASE ISOZYMES IN LONGNOSE AND BLACKNOSE DACE (RHINICHTHYS CATARACTAE AND R. ATRATULUS) AND THEIR HYBRID

Clayton, J. W. (Fisheries Research Board of Canada, Freshwater Institute, Winnipeg, Manitoba), and J. H. Gee (Department of Zoology, University of Manitoba, Winnipeg)
Journal of the Fisheries Research Board of Canada 26, No. 11, 3049-3053 (November 1969)

The electrophoresis of tissue extracts of blacknose and longnose dace and their hybrids was examined in an attempt to distinguish between hybrids and the parental species. Earlier work has demonstrated that lactate dehydrogenase in birds and mammals exists in the catalytically active form as a tetrameter of four polypeptide chains. Electrophoresis of the tissue extracts of these groups of animals, followed by the staining of the separated proteins for specific enzymes, revealed five isozyme bands corresponding to the five possible tetrameter combinations of two kinds of subunits. Kaplan (1964) found that the usually more negatively charged heart (H) subunits are concentrated in aerobic tissues and the highly charged muscle (M) subunits are concentrated in relatively anaerobic skeletal muscle. Five possible HM tetrameters do not occur in fishes as often as they do in other higher invertebrates.

Electrophoresis of tissue extracts of longnose and blacknose dace revealed five isozymes corresponding to tetrameters of heart and muscle type subunits. The species are readily distinguished--the longnose dace isozymes that contain heart

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 Abstracter: F. T. Piskur

7.89 ALPHA-GLYCEROPHOSPHATE DEHYDROGENASE AS AN INDEX OF ICED-STORAGE AGE OF FRESH, GUTTED HADDOCK (MELANOGRAMMUS AEGLEFINUS)

Gould, Edith (Bureau of Commercial Fisheries, Technological Laboratory, Gloucester, Massachusetts)
Journal of the Fisheries Research Board of Canada 26, No. 12, 3175-3181 (December 1969)

This paper describes a new test for judging the iced-storage age of gutted haddock from early loss of quality to the first signs of spoilage. A soluble alpha-glycerophosphate dehydrogenase (αGPdH) shows at least two properties that change measurably during an early loss of quality in ice-stored haddock: (1) a sensitivity to differing concentrations of added Mg^{++} and (2) a partial tolerance to moderate heat. The author proposes the measurement of these two changing properties of αGPdH as a possible test for early loss of freshness in ice-stored haddock. [1 figure, 2 tables, 5 references] [Abstracter: F. T. Piskur]

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much more rapidly than did those of muscle stored at 0° C., and those from muscles left attached to the skeleton fragmented faster than those from muscles stored as fillets. The authors suggest that these results strongly support the morphological method of investigating changes in the quality of fish meat.
[6 figures, 3 tables, 11 references]

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Amino acid	Free amino-acid content of shrimp(a) meat	Amino-acid content of the protein of shrimp(a) meat
	mg./100 g.	g./100 g.
Cystine + cystine	1.37	Traces
Lysine	8.76	58.00
Arginine	12.87	290.79
Histidine	3.07	(b)
Glutamine	(b)	(c)
Aspartic acid	10.90	66.81
Serine	3.35	68.80
Glycine	3.65	311.25
Threonine	3.63	44.43
Glutamic acid	14.15	18.89
α-Alanine	5.60	107.82
Proline	3.99	133.21
Tyrosine	3.95	15.20
α-Aminobutyric acid	(b)	Traces
Methionine	2.36	22.47
Tryptophan	0.98	Traces
Valine	3.39	41.62
Phenylalanine	4.05	20.03
Leucine + isoleucine	13.67	88.31
Oxyproline	(b)	Traces
Taurine	(b)	160.03

(a) Parapenaeus spp.
(b) Does not appear.
(c) No estimations performed.

8.51 FREE AMINO ACIDS AND RELATED SUBSTANCES IN MARINE ORGANISMS

Roberts, Eugene, and J. S. Kittredge (City of Hope Medical Center, Duarte, California)
U.S. Government Research and Development Reports 70, No. 3, 48-49 (February 10, 1970) (Available through the Clearinghouse for Federal Scientific and Technical Information, U.S. Department of Commerce, Springfield, Virginia 22151, 24 pp. Price $3.00, paper copy. Order No. AD-697 976)

The paper reports on a survey of the free amino acids of over 400 tissues of marine organisms. A number of new compounds were identified, some of which are: an acidic amino acid, 2-aminoethylphosphonic acid, was isolated from sea anemones; a new lipid, ceramide 2-amino-ethylphosphonic acid, was isolated from sea anemones and was characterized; a new alpha-amino acid, phosphonoalanine, was isolated. Lipids containing the mono- and trimethyl compounds were isolated. The phytoplankton apparently synthesize phosphonic acids. [Abstracter: F. T. Piskur]

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type subunits show greater electrophoretic mobility. The F1 hybrid displayed a multiple band pattern, as would be expected in a fish able to produce two kinds of heart subunit. A variant type of muscle lactate dehydrogenase was detected in the longnose dace. [3 figures, 2 tables, 13 references]

8.59

7.89 (9.19) CONTAMINATION BY CHLORINATED PESTICIDES. II. DETERMINATION OF INSECTICIDE RESIDUES IN A SAMPLE OF COD LIVER OIL

Baluja, G., M. Dabrio, J. M. Franco, M. A. Murado, and M. E. Pereiro (Centro Nac. Quim. Org., Madrid, Spain)
Chemical Abstracts 71, No. 25, 122455p (December 22, 1969)

The author recommends that the rapid electrophoretic method (Learson, 1969) of identifying fish species, but using authentic flesh samples as standards, be adopted as official first action by the AOAC. Eleven collaborators, using the recommended method, participated in a test to identify 10 unknown fish samples using a set of 9 standard flesh samples. The overall accuracy of identification was 91 percent. [1 table] [Abstracter: F. T. Piskur]

7.89 (7.51) COLLABORATIVE STUDY OF A RAPID ELECTROPHORETIC METHOD FOR FISH SPECIES IDENTIFICATION. II. AUTHENTIC FLESH STANDARDS

Learson, Robert J. (U.S. Fish and Wildlife Service, Bureau of Commercial Fisheries, Gloucester, Massachusetts 01930)
Journal of the Official Analytical Chemists 53, No. 1, 7-9 (January 1970)

8.8 (2.15) RECOMMENDATIONS FOR IMPROVING THE QUALITY OF VESSEL-CAUGHT GROUNDFISH

Lane, J. Perry (Bureau of Commercial Fisheries, Technological Laboratory, Emerson Avenue, Gloucester, Massachusetts 01931)
Fishery Industrial Research 5, No. 5, 203-213 (December 1969)

Because fish start to lose their quality as soon as they are taken from the sea and because the basic causes of the loss in quality are not readily observable to the eye, fishermen need guidelines for slowing the rate at which the quality of the fish is lost.

Recommended here are suggestions that will enable fishermen to slow the rate of quality loss. These recommendations provide guidelines that are designed (1) to reduce the initial numbers of bacteria on newly caught fish, (2) to prevent the fish from being crushed and otherwise physically damaged, (3) to protect the fish from being contaminated by bacteria from such sources as pughs, hand contact, and viscera, (4) to retard the activity of bacteria and enzymes by rapid and sustained chilling of the fish, and (5) to protect the fish from contamination from such sources as fuel oil and sour bilges.

Putting these recommendations into use will increase the demand for groundfish, will make groundfishing more profitable, and will help the U.S. groundfishing industry to meet foreign competition. [9 figures]

 Author's abstract

9.1 NEW CONCEPT FOR MANAGING AQUATIC LIFE SYSTEMS

Cairns, John, Jr. (Department of Biology, Virginia Polytechnic Institute, Blacksburg, Virginia)
Journal of Water Pollution Control Federation 42, No. 1, 77-82 (January 1970)

The most important new development the public expects of biologists is the capability for prediction. Biologists have developed only relatively recently rather primitive prediction systems for complex natural environments. If biologists are to properly fulfill their role in the management of aquatic life systems, they must develop a whole new set of capabilities. These include: (1) development of systems to predict the consequences of various types and intensities of environmental use, (2) development of simulation techniques involving the use of scale models to approximate various alternative uses of the environment so that the consequences of all possible combinations and intensities of use can be estimated in the planning stages and the optimal beneficial combination of uses can be made, (3) development of rapid biological information systems, both "in-stream" and "in-plant," that will permit environmental quality control to be maintained and will provide an early warning of environmental problems, (4) development of aquaculture techniques that will enable the restoration of degraded and damaged areas to a condition that will permit fuller beneficial use than is now possible, and (5) identification of the life-support functions of our environment and the requirements of the environmental components essential to the maintenance of these functions. The author states that the methods and thought patterns of the past will not be adequate to meet the challenge of protecting our ecological life-support system without endangering our industrial base. [12 references]

 Abstracter: F. T. Piskur

9.11 OCEAN ENGINEERING AT THE UNIVERSITY OF WASHINGTON

Anonymous
Trend in Engineering 21, No. 4 (October 1969)

The issue is devoted to ocean engineering at the University of Washington and includes the following articles:

"Ocean Engineering," by Howard C. Merchant p. 2.

Ocean engineering is the application of various engineering disciplines to problems in, on, and around bodies of water. The progress at the University of Washington is linked to the pure and applied marine sciences and to the programs of other groups involved in marine problems, such as economics and law.

"Some Environmental Factors to be Considered in the Design of Thermal Power Plants in the Northwest;" by Ernest O. Salo (Fisheries Research Institute, University of Washington) pp. 3-7, 32.

The degree of environmental change caused by a power plant can be controlled to a large extent by giving due consideration to biological factors in its design and operation. The author makes suggestions for orginal and imaginative designs that may result in greater mutual benefits. [6 figures, 9 references]

"Internal Waves and Their Role in Mixing the Upper Layers of the Ocean," by L. H. Larsen (Department of Oceanography, University of Washington) pp. 8-11, 19.

Studies of the internal waves in the eastern tropical Pacific showed the presence of large-amplitude internal waves generated by atmospheric disturbances. [6 figures, 7 references]

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 Abstracter: F. T. Piskur

9.16 (9.19)(9.2) CATFISH FARMERS ASSESS THEIR FUTURE

James, Carol
Feedstuffs 42, No. 6, 1, 8 (February 7, 1970)

The first day's program of the Second Annual Convention of the Catfish Farmers of America was largely devoted to problems that must be solved before the catfish farming industry can attain its potential. High production costs, the limited market for processed catfish, the probable decrease in market price as the industry expands, the strong possibility that the method of culture (open pond) now being widely used is not the most competitive or the best controlled method, the absence of provisions for reimbursing fish farmers whose diseased crop must be destroyed by Government order, the lack of regulations governing the import or the interstate shipment of diseased fish, and the threat of competition from foreign supplies of wild catfish that are increasingly being exported to the U.S. market (primarily from Brazil) were discussed.

But the most complex problem of all concerns pollution--of the land, the feed, and the water. Since fish eat and breathe whatever is in the water and then return to this same closed environment their own metabolic wastes, they are a segment of a continual recycling system. And because they are, in effect, biological sponges, even extremely low levels of certain pesticides can create a problem for the fish farmer. The conclusion reached about the pesticide-residue problem was:

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 Abstracter: L. Baldwin

9.2
(9.3)

RECENT DEVELOPMENTS CONCERNING THE EXPLORATION AND EXPLOITATION OF THE OCEAN FLOOR

Gottlieb, Allan E. (Department of Communications, Canada)
McGill Law Journal 15, No. 2, 260-278 (June 1969)

This article outlines some of the basic issues now confronting the international community with respect to the exploration and exploitation of the resources of the seabed. It deals primarily with the question of jurisdiction over the mineral resources of the seabed. The author believes that there are two main outstanding problems at this juncture: (1) the redefinition of those areas which are to remain under national jurisdiction (a matter now covered by the Geneva Convention) and (2) the legal regime that will prevail beyond the new limits of national jurisdiction once they are established. The author concludes that we must move ahead as rapidly as possible in such a way as to insure the orderly development of seabed resources on the basis of sound economicsand technical facts. But,we must not substitute for what now exists anything that could prove as detrimental to all as the much feared free-for-all on the oceans.
[Abstracter: F. T. Piskin]
[contains 28 footnotes]

9.11
(9.19)

THE OCEAN: A NATURAL SOURCE OF CARBON MONOXIDE

Swinnerton, J. W., V. J. Linnenbom, and R. A. Lamontagne (Naval Research Laboratory, Washington, D.C. 20390)
Science 167, No. 3920, 984-986 (February 13, 1970)

The oceans may be the largest known natural source of carbon monoxide, contributing as much as 5 percent of the amount generated by burning of fuels (200 million tons per year) by man. The surface waters of the western Atlantic are supersaturated with respect to the atmospheric partial pressures of CO. This condition indicates that the net transport of CO across the air-sea interface should be from the water into the atmosphere. The ocean, therefore, appears to act as a source of carbon monoxide.
[Abstracter: F. T. Piskin]
[2 figures, 10 references]

9.16

if the soil or the water is the source of the problem, little immediate action can be taken; but if the feed is the source, closer surveillance of ingredients and the use of low-fat ingredients such as soybean meal and wheat middlings could solve the problem.

9.16

A MECHANICAL DEVICE FOR ERADICATION OF SUBMERGED AQUATIC WEEDS

Velu, M. (Central Institute of Fisheries Technology (Craft & Gear Wing), Cochin-5, India)
Fishery Technology 6, No. 1, 18-25 (1969)

Fish farmers have several commonly used means of weeding their ponds: manual, chemical, and biological. All have serious drawbacks. Described here is a portable device that can be constructed and used by the ordinary fish farmer. It consists of one or two rakes, an engine-driven winch, a float or trolley, and a boat. Plan drawings of each component are given, and the economics of five different types of operation are compared.
[Abstracter: L. Baldwin]
[7 figures, 1 table, 4 references]

9.11

"An Echo Integrator for Fisheries Research," by Henry W. Lahore and Dean W. Lytle pp. 12-14, 19.
The paper describes an echo integrator to be incorporated into commercial echo sounders, and the acoustic principles by which the device can be used for fish census research. [6 figures, 17 references]
"Finite-Element Solutions for Field Equations With Application to Virtual-Mass Coefficients in Two or Three Dimensions," by B. J. Hartz and G. Schmid, pp. 20-26. [7 figures, 12 references]
"Studies of the Soil Mechanics of Ocean Floors," by M. A. Sherif and R. C. Bostrom. [9 figures, 6 references, and a bibliography of 13 references]
"Civil Engineering in the Ocean: the U.W. Program," by E. P. Richey.

8.80
(3.331)

FACTORS CONCERNING GREEN TUNA

Yamagata, M., K. Horimoto, and C. Nagaoka (Japan Frozen Foods Inspection Corporation, Tokyo, Japan)
Food Technology 24, No. 2, 92-93 (February 1970)

The presence of trimethylamine oxide (TMAO) in the raw meat of tuna is an important factor related to the greening of tuna after cooking. But, other factors such as myoglobin (Mb) and cooking conditions may also affect the development of the green discoloration. The purpose of this study was to determine the relation between TMAO and Mb content of raw tuna meat and cooking temperature and time on the greening of cooked tuna.
When a large amount of TMAO and Mb was present in the raw meat, the cooked tuna meat clearly appeared green. When the Mb content of the raw meat was high, the cooked meat was dark brown, probably due to the presence of met-myoglobin.
When the meat was undercooked at relatively low temperature and time, the green color did not appear, even though a considerable amount of TMAO and Mb was present. Relatively high temperature and long cooking time were required to produce the green discoloration. [4 tables, 8 references]
[Abstracter: F. T. Piskin]

8.59
(1.37)

PHOSPHOGLUCOMUTASE POLYMORPHISM IN THE RAINBOW TROUT, SALMO GAIRDNERII

Roberts, Franklin L., J. F. Wohnus, and Susumu Ohnu (City of Hope Med. Center, Duarte, California)
Chemical Abstracts 72, No. 5, 18614z (February 2, 1970)

9.16 (1.81) CULTCHLESS OYSTER OPERATION SHOWING PROMISE

Frye, John
National Fisherman 50, No. 11, 6C-7C (March 1970)

The first step in a 4-yr. project to find out if seed oysters can be raised commercially with minimum help from nature will be completed this year. The project is one of three in which the U.S. Department of Commerce's Economic Development Administration, with technical assistance from the U.S. Bureau of Commercial Fisheries, is helping in community efforts to create jobs and raise personal incomes. The next step will be toward seeing if hatchery operators can profitably use the techniques developed here.

The focal technique involves cultch-free oysters. It was developed to reduce the mortality resulting from contamination introduced into the hatchery tanks by the shells on which oyster larvae are wont to set. The procedure used to bring the larvae to the setting stage is, briefly, as follows. Mature brood-stock oysters are kept in trays with cornstarch rather than normal oyster food. In from 4 to 6 days, these oysters convert the cornstarch to eggs and sperm, which are stripped from the gonads, stirred together in a beaker, and then placed in clarified water for the 10 or 12 days the fertilized eggs need to become larvae. The larvae are placed in barrels containing a plankton organism that keeps regenerating the food supply; periodically sieved so the barrels can be refilled with enriched water; and removed only when they are ready to set, which they do without any shell or other surface to attach to.

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 Abstracter: L. Baldwin

9.3 PAPERS PRESENTED AT THE FOOD STANDARDS SYMPOSIUM OF THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON FOODS AND NUTRITION

Anonymous
Food Drug Cosmetic Law Journal 24, No. 8 (August 1969)

The following papers were presented at the Symposium held on June 26-27, 1969 in Chicago, Illinois:

"International Standards for Food Products: The Codex Alimentarius," by Robert F. Anderson (American Butter Institute, National Cheese Institute, Inc., Chicago), pp. 374-83.

The author discusses the Codex Alimentarius, a program to harmonize international food standards. He tells of the program's history, membership and format, and progress toward its objectives.

"Food Standards," by D. M. Hegsted (Harvard School of Public Health, Boston, Mass.), pp. 384-9.

The food industries are diverse, with varying and often conflicting points of view. The author believes that committees of the National Research Council-National Academy of Sciences are probably best equipped to arbitrate differences while protecting the public interest.

"Remarks Made at the Symposium on Food Standards," by W. B. Murphy (Campbell Soup Co.), pp. 390-7.

The author is strongly against excessive government inspection of the food industry, and believes that expansion of controls and standards would hinder innovation and development. He presents recommendations for future administration of food controls and standards.

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 Abstracter: F. T. Piskur

9.19 REPORT OF THE SECRETARY'S COMMISSION ON PESTICIDES AND THEIR RELATIONSHIP TO ENVIRONMENTAL HEALTH. PARTS I AND II

Anonymous
U.S. Department of Health, Education, and Welfare, 677 pp. (December 1969). For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Price $3.00

Part I contains the Commission's recommendations along with summaries of the reports of the Subcommittees to the Commission. The Commission's recommendations follow. (1) Initiate closer cooperation among the Departments of Health, Education and Welfare (USDHEW), Agriculture (USDA), and Interior (USDI) on pesticide problems through establishment of a new interagency agreement. (2) Improve cooperation among the various elements of the USHEW which are concerned with the effects of pest control and pesticides. (3) Eliminate within 2 years all uses of DDT and DDD in the United States except those uses essential to the preservation of human health or welfare and those that have been approved unanimously by the Secretaries of the USDHEW, USDA, and USDI. (4) Restrict the usage of certain persistent pesticides in the United States to specific essential uses which create no known hazard to human health or to the quality of the environment and which are unanimously approved by the Secretaries of the USDHEW, USDA, and USDI. (5) Minimizing human exposure to those pesticides considered to present a potential health hazard to man. (6) Create a pesticide advisory committee in the USDHEW to evaluate information on the hazards of pesticides to human health and environmental

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 Abstracter: F. T. Piskur

9.3 PAPERS PRESENTED AT THE FOOD STANDARDS SYMPOSIUM OF THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON FOODS AND NUTRITION

Anonymous
Food Drug Cosmetic Law Journal 24, No. 9 (September 1969)

This is the second set of papers presented at the Symposium on June 26-27, 1969 in Chicago, Illinois.)

"The Role of the Technical Services Division," by Jack C. Leighty (Technical Services Division, Consumer and Marketing Services, U.S. Department of Agriculture, Washington, D.C.).

The author discusses the work of the Division involving the labels that describe meat and poultry products, the standards that provide definitions for such products, and the containers in which such products are packaged.

"Food Standards Procedure--A Lawyer's Recommendations," by Vincent A. Kleinfield, pp. 422-32.

The author urges that the government make clear to officials and examiners of the food industry that food-standard hearings are not intended to be adversary, but are rule-making proceedings designed to bring out all facts, whether or not the facts are in accord with the government's position.

"As CPEHS [Consumer Protection and Environmental Health Service] Sees It," by Charles C. Johnson, Jr., pp. 433-9.

The author urges close cooperation between government, industry, and the medical profession in order to keep up with the rapidly changing patterns in food habits.

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 Abstracter: F. T. Piskur

9.3 COMMUNIST CHINA AND THE LAW OF THE SEA

Cheng, Tao (Trenton State College, Trenton, New Jersey)
American Journal of International Law 63, No. 1, 47-73 (January 1970)

This paper is a comment on the official position of Communist China on various problems related to its internal waters, the territorial sea, and the high seas; it is based upon an examination not only of laws, regulations, international agreements, and other official pronouncements, but--and primarily--of China's peacetime attitudes. The author concludes about Communist China's practice relative to law of the sea: (1) its practice has encompassed nearly all important aspects and all major problems covered by the law of the sea except the Continental Shelf, (2) its stand regarding the extent of the territorial sea and the method of measuring it tends to be expansive, and (3) it has followed the United Nations Conference on the Law of the Sea with interest and on the whole tends to be prepared to defer to whatever might be acceptable to a two-thirds majority of nations at the conference. [contains 139 footnotes] [Abstracter: F. T. Piskur]

9.3 PAPERS PRESENTED AT THE FOOD STANDARDS SYMPOSIUM OF THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON FOODS AND NUTRITION

Anonymous
Food Drug Cosmetic Law Journal 24, No. 10 (October 1969)

"Food Standardization Past, Present and Future," by William W. Goodrich (Division of Food, Drugs, and Environmental Health, U.S. Department of Health, Education, and Welfare), pp. 464-73.

The author concludes his article with several questions including what can and should be done (1) to control the protracted proceedings, the inordinate delays, and the excessive costs of food standardization and (2) to meet the challenge of the new day in technological manipulation of foods to promote honesty and fair dealing in the interest of consumers. An effective mechanism must be developed to identify and cope with the new technology.

"Research on Standardized and Nonstandardized Foods in Educational Institutions," by K. G. Weckel (University of Wisconsin, Madison), pp. 474-9.

The author discusses the difficulty of justifying university food research projects in areas of rigid standardization.

"Summary of Symposium Reports," by Bernard L. Oser (Food and Drug Laboratories, Inc., New York), pp. 480-5.

The author summarizes and comments on the proceedings of the Symposium.
[Abstracter: F. T. Piskur]

9.19 MARITIME LIABILITY FOR OIL POLLUTION -- (9.3) DOMESTIC AND INTERNATIONAL LAW

Mendelsohn, Allan I. (Glassie, Pewett, Beebe and Shanks, Washington, D.C.)
The George Washington Law Review 38, No. 1, 1-31 (October 1969)

This article discusses efforts in progress in the United States Congress and in the international maritime legal community concerning maritime liability for oil pollution. The author states that the Congress is faced with the major and immediate burden of rectifying a United States law which has been with us, almost unchanged, since 1851 [Act of March 3, 1851, ch. 43, § 3, 9 Stat. 635; and as it reads today--46 U.S.C. § 183 (1964)].
[90 footnotes] [Abstracter: F. T. Piskur]

9.3 "Food Standards," by Don Muhm (Des Moines Register and Tribune, Iowa), pp. 398-407.

The author believes that the American consumer is entitled to the security of knowing that all food products he uses are inspected and guaranteed by government agencies.

"Standard-Setting-FDA," by J. Kenneth Kirk (U.S. Food and Drug Administration, Washington, D.C.), pp. 408-11.

Standards should avoid all loopholes or opportunities that might allow debasement of food, and standards must be efficiently enforced across-the-board.

9.3 "Food Standards: The Balance Between Certainty and Innovation," by H. Thomas Austern, pp. 440-54.

The author discusses the demands of the standards of identity, quality, and fill by the Food and Drug Administration as they affect the demands for certainty and innovation by manufacturers and consumers.

9.19 quality and to advise the Secretary on related matters. (7) Develop suitable standards for pesticide content in food, water, and air and for other aspects of environmental quality, standards that: (a) protect the public from undue hazards, and (b) recognize the need for optimal human nutrition and food supply. (8) Seek modification of the Delaney Clause (Federal Food, Drug, and Cosmetic Act) to permit the Secretary USDHEW to determine when evidence of carcinogenesis is adequate to justify restricting food that contains chemicals. (9) Establish a USDHEW clearinghouse for pesticide information and develop pesticide protection teams. (10) Increase Federal support of research concerned with all methods of pest control, with the effects of pesticides on human health and the ecosystems, and with improved techniques for prediction of human effects. (11) Provide incentives to industry to encourage the development of more specific pest control chemicals. (12) Review and consider the adequacy of legislation and regulation and consider the adequacy of regulations concerned with identifying, registering, packaging, and transporting pesticides; with monitoring and controlling pesticide-containing industrial effluent; and with indemnifying procedures. (13) Develop, in consultation with the Council of State Governments, model regulations for the collection and disposal of unused pesticides, used containers, and other pesticide-contaminated materials. (14) Increase participation in International cooperative efforts to promote safe and effective usage of pesticides.

Part II contains the complete reports and conclusions of four Subcommittees and the four Advisory Panels to the Commission and covers the following subject areas: Uses and Benefits, Contamination, Effects of Pesticides on Nontarget Organisms Other Than Man, Effects of Pesticides on Man, Carcinogenicity of Pesticides, Interactions, Mutagenicity of Pesticides, and Teratogenicity of Pesticides. Over 5,000 references to published or ongoing scientific research were reviewed and evaluated by the staffs making these reports.

9.16 The oysters are grown to survivable size (about 2 in.) in large cages of galvanized wire suspended in the river. Periodically the cages are removed so the oysters can be washed of silt, mud, and fouling growths and so the slower-growing oysters can be culled. Although the culch-free oyster is regular in shape and easy to handle, and although suspending him in cages protects him from predators (particularly the crab), the population explosion brought on by the success of the technique has created a pressing space problem, for a week-old spat needs 200 or 300 times as much room as a larva to keep from smothering. Another problem facing the four packing companies that are conducting the work (under contract to the Economic Development Administration) is the lack of immunity to disease characterizing the oysters produced so far. Indications are, however, that an MSX-resistant stock is beginning to develop.

When the contract ends this year, a public report will be made on the suitability of the seed, the costs of this type of operation, and the need for artificial cooling or heating of tank water. [6 photographs]

9.3 SEDENTARY FISHERIES AND ARTICLE 2(4) OF THE CONVENTION ON THE CONTINENTAL SHELF -- A PLEA FOR A SEPARATE REGIME

Goldie, L. F. E. (Loyola University of Los Angeles, Los Angeles, California)
American Journal of International Law 63, No. 1, 86-97 (January 1969)

The author states that the open-endedness of the Continental Shelf Convention renders it vulnerable to misuse as a camouflage for extravagant claims by states seeking to extend their coastal jurisdiction far out until they reach a median line or a thalweg. He indicates, also, that the definition of the Continental Shelf in terms of exploitability and the inclusion of "sedentary species" among the "natural resources" of the Continental Shelf are the two greatest sources of this indeterminacy. He suggests that their elimination from the Convention would greatly reduce its fictional elements. He proposes a Sedentary Fisheries Article as follows:

"Sedentary Fisheries (1) The regulation of sedentary fisheries may be undertaken by a state in areas of the high seas contiguous to its territorial waters, where such fisheries have long been maintained and conducted by nationals of that state, provided that non-nationals may enjoy, subject to the principle of abstention, such historical privileges as they may have acquired by long usage. Such regulations will, however, not affect the general status of the areas as high seas. (2) The resources of sedentary fisheries within the scope of this article are living organisms which, during their adult life, are permanently or biologically connected with, and are incapable of movement on, the seabed or subsoil of the high seas. (3) The coastal state's exclusive authority over a sedentary fishery within

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9.3 THE OCEANS' RESOURCES AND INTERNATIONAL LAW -- POSSIBLE DEVELOPMENTS IN REGIONAL FISHERIES MANAGEMENT

Goldie, L. F. E. (Loyola University of Los Angeles, Los Angeles, California)
Columbia Journal of Transnational Law 8, No. 1, 1-53 (Spring 1969)

This paper had two purposes: (1) to point out the barrenness of the traditional legal pattern for reducing international fisheries disputes to ordered settlement and (2) to emphasize the value of replacing adversary debates with the coordinating formulation of a management system directed to developing the resource, improving the techniques for its more economic exploitation, and assuring its equitable distribution.

The author proposes a managerial basis for conciliating between claims, in place of the concepts of international judicial settlement, arbitration, and customary forms of conciliation. A regime directed to achieving managerial goals would have many advantages over the certainty of the survival of a stock and even of the maintenance of the stock's population levels. It could (1) increase the efficiency of the fishery's production (thus reducing the cost of a given catch) and (2) could improve the stock (thereby increasing the value of the catch). The "rent of the sea" (surplus over cost on the amount traditionally regarded as profits) generated by the fishery could be distributed between various developmental programs of the region, including the further improvement of the fishery. The regime would also be directed to effectuate a distributive justice in the allocation of the benefits of the resources' economic exploitation. To enable such a

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9.3 THE FEDERAL FOOD DRUG AND COSMETIC ACT AS AN EXPERIMENT IN QUALITY CONTROL

Carpenter, William, Jr.
Syracuse Law Review 20, No. 4, 883-910 (Summer 1969)

The Food Drug and Cosmetic Act of 1938 [21 U.S.C. 301 (1952)] was enacted primarily to protect the health and economic interests of the food consumer. To accomplish this end, the Act employed the primary device of standardization of food, a form of quality control. In this article the author demonstrates that this device, with a few minor exceptions, has satisfactorily advanced the interests of the food consumer, but not without some cost. Since the enactment of the Act of 1938, the market structure of the food industry has changed so markedly that in 1964 Congress created the "National Commission on Food Marketing" whose main functions were to "...identify significant developments in the industry, to gauge their future course, to appraise their consequences, and to present their findings and conclusions...." to Congress. It is the author's thesis in this present paper, that the quality control device of standardization in the Act of 1938 has in large measure contributed to the economic concentration of the food industry and that this phenomenon should be considered as a possible result of any government-induced quality control scheme. In this paper, he traces the origins and development of federal food legislation, examines the operation of the Food Drug and Cosmetic Act (especially the standardization process), and then considers the impact of food standards upon the industry.

The author concludes that, in light of the recent vogue of consumer protection legislation, it would be wise to understand the relation between consumer

9.3 INSTITUTE OF FOOD TECHNOLOGISTS' SYMPOSIUM ON INTERNATIONAL FEEDBACK AND GOOD MANUFACTURING PRACTICES

Anonymous
Food Drug Cosmetic Law Journal 24, No. 10 (October 1969)

The following are some of the papers that were given at the Symposium on 13 May 1969, in Chicago, Illinois.

"The Likely Impact of International Standards for Foods and Food Ingredients On 'Hidden Tariffs'," by Michael F. Markel (Markel, Hill and Byerley, Washington, D.C.).

The author believes that the adoption of international food standards involves more than the obvious leveling of requirements. Certain food laws may have the effect of "hidden tariffs." Examples of such laws and regulations that have served to exclude U.S. approved foods from foreign markets include the banning of ascorbic acid in moisturized prunes and of antioxidants in fats and oils.... The author feels that the U.S. regulated industry has a great stake in the work of the Codex Alimentarius Commission--even greater than the stake of industry generally in the General Agreement on Tariffs and Trade negotiations--because the Codex will affect not only international but also domestic trade.

"International Food Standards--What Trade Associations Can do," by Malcolm R. Stephens (Institute of Shortening and Edible Oils, Inc., Washington, D.C.), pp. 493-6.

The author recommends active participation in international food standardization programs by industry-wide organizations.

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9.3 A CRITICAL LOOK AT GOOD MANUFACTURING PRACTICES REGULATIONS OF THE FDA

Levin, Leonard M.
Food Drug Cosmetic Law Journal 24, No. 9, 455-460 (September 1969)

The Current Code of Good Manufacturing Practices (Sanitation) in Manufacturing, Processing, Packing, or Holding Human Foods (GMP) went into effect May 26, 1969. Among the codes to be issued are those for smoked fish and for breaded shrimp. The author discusses the Code of GMP regulations concerning food preparation and believes that it is an excellent document if the GMP's are to serve only as guidelines. However, if the GMP's are to have the force of law, the author feels that they are dangerously imprecise. [Abstracter: F. T. Piskur]

9.3

the scope of this article shall be exercised to ensure the good management of the fishery. In particular that state's regulation of the fishery should prohibit biologically wasteful practices and promote economically efficient procedures for the production and marketing of the resource. (4) A state may not assert claims under this article to exercise jurisdiction over sedentary fisheries conducted beyond the two hundred metre bathymetric contour line lying seaward off its shores and beyond territorial waters, being the contour line defining, in terms of depth, the continental shelf area subject to its sovereign rights as provided in the Convention on the Continental Shelf done at Geneva on 29 April 1958. (5) This article shall not apply where states have established a treaty regime to regulate the conservation of and access to any specific sedentary fishery, unless the treaty establishing that regime so provides."

[contains 36 footnotes]

9.3 INDIAN HUNTING AND FISHING RIGHTS II

Hobbs, Charles A. (Wilkinson, Cragun, and Barker, Washington, D.C.)
The George Washington Law Review 37, No. 5, 1251-1273 (July 1969)

The first article by the author appeared in vol. 32, page 504, of the 1964 issue of the referenced journal. In this present report he discusses in detail the legal decisions of the Supreme Court in two recent cases [391 U.S. 392 (1968) and 391 U.S. 404 (1968)].

The author concludes that considerable litigation, or else a much greater measure of agreement and cooperation between tribal and state governments, will be needed before the hunting and fishing rights problem begins to stabilize. Apparently, voluntary tribal regulation of members has been a useful step. However, the author states that many of the problems may be ascribed to the failure to view questions of regulation in terms of what is a fair allocation of fish and game to the Indians, and until such an approach is adopted, state regulation of Indian fishing [and hunting] rights can only remain a source of confusion and disagreement. [130 footnotes] [Abstracter: F. T. Piskur]

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management regime to work efficiently, all participating states would have to waive whatever legal claims they might assert in a more traditional arena.

The author discusses three forms of international management: national quotas, agent states, and administrative conciliation. Also he discusses two possible variants of the management conciliation model: (1) a commission to regulate, on an on-going basis, the conduct of the fishery with a view to improving stocks, gear, and techniques, and economic returns and (2) a multinational public enterprise to conduct the fishery either by means of a system of licenses or as the sole employer of the fishermen of the participating states, possibly as a producers' cooperative directly engaged in the fishery. The author suggests that the enterprise which directly conducts the fishery as the sole employer and cooperative of the fishermen of the participating states is the preferred one. This model would be more effectively geared to achieving the goal of fuller responsiness of the conduct of the fishery to the political needs of the region because (1) the enterprise would be in control of the fishery; (2) it would have more direct control over the fishery than the licensing model, so would realize conservation and welfare goals more effectively; (3) it would provide the most effective substitute for the traditional dichotomy of the international law of the sea; and (4) it would establish an effective and equitable regime of participation in, and distribution of, the wealth of regional high seas fisheries.

[contains 151 footnotes]

9.3 THE SOVIET UNION AND THE CONTINENTAL SHELF

Butler, William E. (Harvard Law School, Cambridge, Massachusetts)
American Journal of International Law 63, No. 1, 103-107 (January 1969)

The Presidium of the U.S.S.R. Supreme Soviet on 6 February 1968 adopted an edict on the Continental Shelf. This edict is the first example of Soviet legislation governing the legal status of the Continental Shelf beyond the 12-mile limit of Soviet territorial waters. The edict incorporates the definition of the Continental Shelf contained in the 1958 Geneva Convention on the Law of the Sea, with the addition that "the seabed and subsoil of depressions situated in the Continental Shelf of the U.S.S.R., irrespective of their depth, shall be part of the Continental Shelf of the U.S.S.R." The natural resources of the Continental Shelf are placed under state ownership of the Soviet Union. Foreign individuals and companies are prohibited from carrying out research, exploration, and exploitation of natural resources and other work on the Continental Shelf of the U.S.S.R. unless permission has been expressly granted in an international agreement to which the U.S.S.R. is a party or unless competent Soviet authorities issue a special permit. The edict implements the provisions of the Geneva Convention pertaining to the construction and location of installations and other devices.
[contains 20 footnotes] [Abstracter: F. T. Piskur]

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protection devices (such as quality control) and industry concentration. Furthermore, a study should be made to determine whether this nation's antitrust policy is still relevant to an era that stresses consumer protection. In short, the author believes that the federal government should study the long-term effect of its consumer protection laws. [149 footnotes]

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"Codex Alimentarius Feedback," by J. Bryan Stine (Quality Standards and Regulatory Compliance, Kraft Foods Division, Kraftco Corp.), pp. 497-500.
"Problems in Reaching International Agreement on Food Regulation and Standards," by V. Enggaard (Danish Meat Products Laboratory, The Royal Veterinary and Agricultural College, Copenhagen, Denmark), pp. 501-5.

0.3 IUPAC-IUB COMBINED COMMISSION ON BIOCHEMICAL NOMENCLATURE; ABBREVIATIONS AND SYMBOLS FOR CHEMICAL NAMES OF SPECIAL INTEREST IN BIOLOGICAL CHEMISTRY; REVISED TENTATIVE RULES (1965)

Anonymous
Archives of Biochemistry and Biophysics 136, No. 1, 1-12 (January 1970)

The revised tentative rules are issued by the combined Commission on Biochemical Nomenclature of the International Union of Pure and Applied Chemistry and the International Union of Biochemistry. The various major sections of the report cover (1) Introduction, (2) Polypeptides and Proteins, (3) Carbohydrates, (4) Phosphorylated Compounds: General, (5) Nucleotides and Nucleic Acids, (6) Coenzymes, (7) Miscellaneous Compounds, (8) Standards for New Abbreviations, and (9) Alphabetical Lists. Reprints of the Tentative Rules may be obtained from Waldo E. Cohn, Director, NAS-NRC Office of Biochemical Nomenclature, Oak Ridge National Laboratory, Box Y, Oak Ridge, Tennessee 37831, U.S.A. [Abstracter: F. T. Piskur]

0.3 IUPAC COMMISSION ON THE NOMENCLATURE OF ORGANIC CHEMISTRY AND IUPAC-IUB COMMISSION ON BIOCHEMICAL NOMENCLATURE REVISED TENTATIVE RULES FOR NOMENCLATURE OF STEROIDS

Anonymous
Archives of Biochemistry and Biophysics 136, No. 1, 13-35 (January 1970)

The report covers 11 rules of steroid nomenclature: (1) General, (2) Fundamental carbocycles, (3) Penta- and hexa-cyclic modifications, (4) Derivatives, (5) Stereochemical modifications, (6) Shortening of side chains and elimination of methyl groups, (7) Ring contraction or expansion, (8) Ring fission, (9) Modification by bond migration (abeo system), (10) Hetero modifications, and (11) Steroid alkaloids. The Appendix contains guidelines for steroids containing additional rings. [Abstracter: F. T. Piskur]

2.1121 (9.6) DEEP SEA TRAWLING AND WING TRAWLING

Garner, John, Alan Graham, and D. Love (Gourock Ropework Co. Ltd., Port Glasgow, Scotland)
International Marine Publishing Co., Camden, Maine (n.d.). 108 pp. $6
National Fisherman 50, No. 11, S3 (March 1970)

One of the most noteworthy features of this book is its illustrations--it has 81 exceptionally clear drawings, 9 on large fold-out pages and 54 in color, and 23 photographs. Chapter titles are: Materials; Net Braiding; The Theory of Nets; Details of a Trawl (Granton Type); Rope and Wire Working Gear; Running Gear; "Dan Gear"; Hauling and Shooting; Net Mending; Bends, Hitches, Knots and Splices; The Wing Trawl; Operating a Wing Trawl as a Trawl; and Operating "Gourock" Wing Trawl on the Seining Principle. [Abstracter: L. Baldwin]

2.3 SHRIMP PROCESSING (1.85)

U.S. Patent 3,466,699
Willis, J. C., and O. B. Sundberg; Alaska Peelers, Inc.) (pat.)
Food Technology 24, No. 1, 48 (January 1970)

The apparatus deshells shrimp. The equipment employs curved belts whose outward areas travel at higher lineal speeds than the radially inward areas. [Abstracter: F. T. Piskur]

0.8 SAFE HANDLING OF SOLVENTS IN CENTRIFUGE OPERATIONS
(6.54)

Price, Eugene B. (Geigy Chemical Corporation, Cranston, Rhode Island)
Industrial and Engineering Chemistry 62, No. 1, 48-52 (January 1970)

This paper discusses a nitrogen purge-oxygen analyzer system installed on a centrifuge system using highly volatile and flammable solvents. In the manufacture of certain pharmaceuticals and fine industrial chemicals, stainless-steel centrifuges are used to extract products out of such organic solvents as toluene, acetone, methanol, isopropyl alcohol, and monochlorobenzene. Provisions, therefore, must be made to eliminate the possibility of these highly volatile and flammable materials being ignited and exploding. The author's company designed a system for reducing the concentration of oxygen inside the centrifuging equipment units to a point well below the ignition requirements of the solvents present. In addition, the system incorporates special precautionary expedients for reducing the causes of sparking, principally static electricity.
[5 illustrations] [Abstracter: F. T. Piskur]

0.112 CAMERA BELOW: THE COMPLETE GUIDE TO THE ART AND SCIENCE (2.12)(9.6) OF UNDERWATER PHOTOGRAPHY

Frey, Hank, and Paul Tzimoulis (Association Press, New York (1968) (illus.) $12.00
Underwater Naturalist 6, No. 2, 46 (Summer-Fall 1969)

This well-illustrated book (over 100 examples of the best work of the authors and other well-known underwater photographers) clearly describes the ocean environment and what the underwater photographer must do to fit himself to his task. It discusses equipment, from the simplest to the most complex, and the techniques of using it effectively. [Abstracter: L. Baldwin]

9.12 OCEANIC OCCURRENCE OF BLACK ROCKFISH (SEBASTODES MELANOPS) IN THE CENTRAL NORTH PACIFIC

Dunn, J. R. (Bureau of Commercial Fisheries, Biological Laboratory, Seattle, Washington 98102), and C. R. Hitz (Bureau of Commercial Fisheries, Exploratory Fishing and Gear Research Base, Seattle 98102)
Journal of the Fisheries Research Board of Canada 26, No. 11, 3094-3097 (November 1969)

The adult rockfish of the genus Sebastodes are considered to be dermersal fish of the Continental Shelf. This paper reports the capture of a black rockfish offshore (50°00' N., 165°00' W., over 200 miles south of the Alaska Peninsula) in a surface gill net. This event, and reports of other offshore captures of this species of rockfish, suggests that this species may, at some stage of its life or in some races, maintain a pelagic existence.
[13 references] [Abstracter: F. T. Piskur]

2.3 COMMINUTED FISH PRODUCT

Canadian Patent 823,610
Pottle, J. C.; Nova Scotia Research Foundation (pat.)
Food Technology 24, No. 1, 48 (January 1970)

Raw fish is comminuted at a temperature of 5° C. or lower. A rigid gel forms. [Abstracter: F. T. Piskur]

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